

South Carolina

Annual State of the Beaches Report

2008



Ocean and Coastal
Resource Management

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Introduction

The following report summarizes changes to South Carolina's beaches during 2007 (January to December). The results are based on beach profile surveys conducted during 2007 at 399 monitoring stations throughout the state using 483 unique beach profiles. Surveys start at a benchmark located landward of the primary dune or seawall, and at most stations continue down the beach face to a depth of -25 ft or an offshore distance of 3,000 ft, whichever is reached first. Across the dune, data are collected on foot using a Global Positioning System (GPS) receiver. On the upper beach and intertidal beach at low tide, data are collected using a GPS receiver carried on a pole mount or mounted on an ATV 4-wheeler. For the offshore portion of the profile, data are collected from a boat with a GPS receiver and fathometer. These three data sets can then be integrated into one seamless beach profile, which shows a cross-section of the beach shape at the time of the survey. The data can then be compared to similar data from previous years to determine what changes have occurred to the beach profile.

The reference elevation used for data collection and for all elevations discussed in this report is the North American Vertical Datum of 1988 (NAVD88), which is approximately the same as mean sea level. Profiles are analyzed for dune erosion or scarping, changes in beach slope, and changes in unit-width sand volume, the amount of sand from the dune down to a chosen cutoff elevation per linear ft of shoreline. The presence or absence of a berm, the shelf of dry sand between the dune and the high-water mark, is noted, as well as any sand bars and corresponding troughs. Berm width is particularly important, since it represents the amount of recreational dry-sand beach seaward of the dune that is available at high tide.

Most beaches in South Carolina go through a yearly cycle of profile change. In the summer, smaller waves tend to push sand up the beach, forming a wider berm and a steeper beach slope below mean high water. In the winter, higher energy waves erode sand from the berm and move it to an offshore bar, resulting in a narrower high-tide beach and a more gently sloping beach below mean high water. In many cases this seasonal profile variation is greater in magnitude than the long-term trend for a particular

island or beach—that is, the change observed from October to April and then from April back to October can be greater than the change observed for consecutive Aprils or Octobers.

As called for under the Beachfront Management Act, all beaches in the state have been classified as standard zones or inlet zones. Inlet zones are regions in close proximity to a tidal inlet, where the presence of the inlet plays a dominant role in erosion or accretion patterns on the beach. Most inlet zones are unstabilized, meaning the inlet channel is not anchored by jetties or groins, and the surrounding shoreline is often quite dynamic. On the location maps that appear in this report, standard zones are designated as “S”, unstabilized inlet zones as “Iu”, and stabilized inlet zones as “Is”. In general, the larger Sea Islands in Charleston and Beaufort counties consist of a standard zone in the central portion of the island and an inlet zone at either end. The smaller Sea Islands are entirely inlet zones. In the Grand Strand, the shoreline is a continuous standard zone, interrupted by small inlet zones at the swashes.

The remainder of this report contains individual summaries for each island or beach in the state surveyed during the past year. The area from Capers Island to North Island is essentially undeveloped and is not surveyed. Summaries are presented in a south-to-north progression. The geographic setting of each beach is discussed, along with any significant long-term trends. A location map is also provided showing survey monument locations. Finally, a state-wide summary is found at the end of the report, along with an assessment of beach renourishment needs.

Plots for any individual monitoring station can be viewed on the internet at <http://gis.coastal.edu/pmas>, a web site developed and maintained by Dr. Scott Harris (College of Charleston). The DHEC website at www.scdhec.net/environment/ocrm will also provide information on any changes to this beach profile website.

Regional Summaries

Daufuskie Island

Daufuskie Island is located to the south of Hilton Head Island, between Calibogue Sound to the northeast and Mungen Creek to the southwest. The entire island has been classified as an unstabilized inlet zone. A renourishment project was constructed here in December 1998, and has performed very well over the past 9 years. Long-term erosion rates on the island average -4 to -5 ft per year but go as high as -10 to -11 ft per year in places. Beginning at the northeast end of the island in the Melrose Tract and moving southwest, erosion rates begin at -1 ft per year but quickly increase to -7 ft per year near the clubhouse, then reach a maximum of -11 ft per year along the southern end of the Melrose Tract and in the northern end of the Oakridge Tract. There is a wooden bulkhead approximately 4,000 ft long in this area.



Figure 1. Station numbers for Daufuskie Island.

Table 1. Beach profile data for Daufuskie Island.

| Benchmark | Profiles in 2007 | Profiles in 2006 | First Survey Year | Total Profiles |
|------------------|-----------------------------|-----------------------------|------------------------------|---------------------------|
| 1380 | 04/17 | None | 1988 | 21 |
| 1360 | 04/17 | None | 1988 | 25 |
| 1340 | 04/17 | None | 1988 | 22 |
| 1320 | 04/17 | None | 1988 | 25 |
| 1300 | 04/17 | None | 1988 | 23 |

At the southwest end of the Oakridge Tract the long-term erosion rate decreases to about -6 ft per year, and continues to decrease to about -4.5 ft per year through much of the Bloody Point tract. At the southern end of the Bloody Point tract, at Bloody Point, the rate increases again to a maximum of approximately -8.5 ft per year. This area is very dynamic; it experienced extreme short-term erosion during much of 2001 and 2002, and then became highly accretional in 2003.

There are a total of 12 monitoring stations on Daufuskie Island, with the earliest beach survey data collected in 1988. Five of these 12 stations were surveyed most recently in October 2002, August 2005, and April 2007. At station 1300, in the Oak Ridge tract just south of the bulkhead, the 2007 survey was the most recent since 2002. Since that time, the beach has eroded over 150 ft. At station 1320, in the Melrose Tract about 1200 ft north of the southern end of the bulkhead, the beach has migrated landward approximately 75 ft with the loss of the primary berm. At 1340, the other station along the bulkhead in the Melrose Tract, the upper beach has eroded back over 100 ft and dropped in elevation between five and eight ft since the 2002 survey. North of the bulkhead the beach at station 1360 has eroded about 40 ft since 2002 and still shows a substantial beach renourishment sand berm. At station 1380, located at the northeast end of the development, the renourishment sand has eroded over 90 ft since 2002, leaving a remnant berm which is still forty ft wide and over seven ft high.

Hilton Head Island

Hilton Head Island, located between Calibogue Sound to the southwest and Port Royal Sound to the northeast, is one of the state's largest barrier islands. Hilton Head Island can be divided into five geomorphologic reaches, which are each discussed below. A beach renourishment project placed 2.5 million cubic yards of sand on the Hilton Head shoreline between May and November 1997, and another project of similar magnitude was constructed in the summer of 2006. Most recent beach survey data was collected in July 2004, August 2005, and April 2007.



Figure 2. Station numbers for Hilton Head Island.

Table 2. Beach profile data for Hilton Head Island.

| Benchmark | Total Profiles Collected in 2007 | Total Profiles Collected in 2006 | First Survey Year | Total Profiles |
|------------------|---|---|--------------------------|-----------------------|
| 1478 | 04/18 | None | 1988 | 31 |
| 1477 | 04/18 | None | 1990 | 24 |
| 1475 | 04/18 | None | 1988 | 35 |
| 1474 | 04/18 | None | 1990 | 23 |
| 1472 | 04/18 | None | 1988 | 29 |
| 1468 | 04/18 | None | 1998 | 6 |
| 1466 | 04/18 | None | 1998 | 6 |
| 1465 | 04/18 | None | 1998 | 7 |
| 1463 | 04/18 | None | 1988 | 30 |
| 1462 | 04/18 | None | 1990 | 30 |
| 1460 | 04/18 | None | 1988 | 31 |
| 1457 | 04/18 | None | 1988 | 30 |
| 1456 | 04/18 | None | 2002 | 3 |
| 1454 | 04/16 | None | 1988 | 36 |
| 1451 | 04/16 | None | 1988 | 31 |
| 1448 | 04/16 | None | 1998 | 1 |
| 1446 | 04/16 | None | 1990 | 24 |
| 1445 | 04/16 | None | 1988 | 36 |
| 1444 | 04/16 | None | 1990 | 23 |
| 1442 | 04/16 | None | 1988 | 31 |
| 1440 | 04/16 | None | 1990 | 25 |
| 1439 | 04/16 | None | 1988 | 31 |
| 1438 | 04/16 | None | 1990 | 30 |
| 1437 | 04/16 | None | 1990 | 12 |
| 1436 | 04/16 | None | 1998 | 7 |
| 1433 | 04/16 | None | 1988 | 32 |
| 1430 | 04/16 | None | 1988 | 36 |
| 1427 | 04/16 | None | 1988 | 30 |
| 1424 | 04/16 | None | 1998 | 7 |
| 1421 | 04/16 | None | 1988 | 30 |
| 1418 | 04/16 | None | 1988 | 36 |
| 1417 | 04/16 | None | 1990 | 23 |
| 1415 | 04/17 | None | 1988 | 29 |
| 1412 | 04/17 | None | 1988 | 32 |
| 1409 | 04/17 | None | 1998 | 5 |

The portion of Sea Pines Plantation bordering on Calibogue Sound is an unstabilized inlet zone, subject to the influence of the Sound. The long-term shoreline change rate is 2 to 5 ft per year of accretion. This area experienced moderate erosion during the mid 1990's and was not renourished as part of the big 1997 project, but was renourished in the winter of 1999. SCCC monuments 1400-1409 are located here. As a result of the 1999 renourishment the beach width here was increased by as much as 250 ft, and even with some erosion over the past 8 years is still more than adequate. Most stations here were stable to slightly accretional during the most recent survey period.

The second zone on Hilton Head is a 10 mile-long standard zone that extends from station 1412 in Sea Pines Plantation to station 1469, just south of the Folly. This area includes South Forest Beach, North Forest Beach, and Palmetto Dunes. Both North Forest Beach and Palmetto Dunes were included in the 1997 renourishment project, which began at the Hilton Head Inn. The 2006 renourishment added between 100 and 150+ ft of new beach in this area. Long-term shoreline change rates vary in this zone-- they are accretional south of Coligny Circle and erosional north of Coligny Circle, with the rate of erosion increasing with distance from the Circle and reaching a maximum of -6 ft per year in Palmetto Dunes.

All stations in Sea Pines, from monument 1412 through 1424, were stable or showed slight accretion on the intertidal beach with some movement and growth of dunes in the upper beach. This area is generally the most stable to accretional section of Hilton Head Island, and has a well-established dune. Most stations in South Forest Beach, 1427 through 1436, showed considerable growth in the upper beach due to the renourishment in 2006. This area is also stable in the long-term, with a well-established dune.

In North Forest Beach and Palmetto Dunes the long-term shoreline change rates become erosional. Beach profiles here showed sand deficits prior to renourishment, but unit-width volumes increased dramatically as a result of the 1997 and 2006 beach fill projects. Stations 1437 through 1448, located in North Forest Beach, showed substantial erosion of the renourishment berm between September 1998 and November 1999, but only minimal loss of renourishment sand since then. A steep profile still exists in the 2007 survey data, indicating the project is still equalizing to the wave climate.

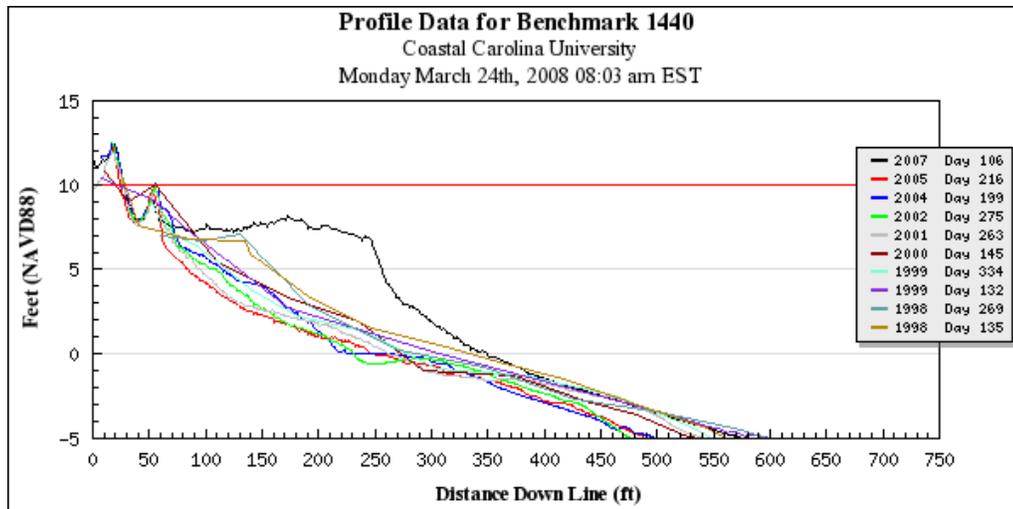


Figure 3. Beach profiles for station 1440 in North Forest Beach on Hilton Head Island.

Stations 1451 through 1466 are located in Palmetto Dunes, where long-term erosion rates range from -5 to -6 ft per year. These stations showed the same general trend as North Forest Beach—most stations had been stable from 2000 through July 2004 but experienced 20 to 40 ft of upper-beach berm erosion through August 2005. The renourishment in this zone still maintained a beach berm of 100 to 150+ ft in 2007 in most places.

The third zone on Hilton Head is a 2,200-ft long unstabilized inlet zone, located on either side of the Folly. Stations 1468, 1469 and 1472 are the monitoring stations in this reach, which historically was very dynamic because of the inlet channel. However, a small jetty constructed on the south side of the Folly in 1997 has helped stabilize this region. Long-term erosion rates here are around -2 ft per year. Between the 2005 and 2007 surveys, station 1468 still has a 100+ ft berm from the renourishment, while a new dune was formed at station 1472 with little change in the berm profile.

The fourth zone is a 1.3 mile-long standard zone that extends from just north of Burke’s Beach Road to the Westin Hotel and includes stations 1474 through 1478. Long-term shoreline change rates here are stable. Between 2005 and 2007, the upper beach accreted between 100 and 150 ft throughout the upper profile.

The fifth zone is an unstabilized inlet zone that includes all of the Port Royal Plantation shoreline. Survey stations 1481 through 1496 are located here. This region

shows two distinct long-term shoreline trends, with accretion along the Atlantic shoreline to station 1484, and erosion of -3 to -4 ft per year along Port Royal Sound. Although stations 1481 and 1484 are accretional in the long-term, there has been a recent episode of extreme erosion along a 1,100 ft section of shoreline centered around station 1484. This area of erosion is landward of a portion of Joiner Bank that has dissipated in recent years, exposing this section of shoreline to increased wave energy. Houses in this area are still well landward of the erosion line.

Fripp Island

Fripp Island is a three-mile long barrier island located between Pritchards Island and Skull Inlet to the southwest, and Hunting Island and Fripp Inlet to the northeast. Development on the island is primarily single family residential, and the island is almost continuously armored with revetments. The central portion of the island is classified as a standard zone, with an unstabilized inlet zone at the southwest end and a stabilized inlet zone at the northeast end. An analysis of long-term erosion trends has shown the island to be stable, although sand-bypassing events across Fripp Inlet, with a period of decades, can cause significant changes to the beach profiles on the island.



Figure 4. Station numbers for Fripp Island.

Table 3. Beach profile data for Fripp Island.

| Benchmark | Profiles Collected in 2007 | Profiles Collected in 2006 | First Survey Year | Total Profiles |
|------------------|-----------------------------------|-----------------------------------|--------------------------|-----------------------|
| 1765 | 06/07 | None | 1998 | 3 |
| 1760 | 06/07 | None | 1998 | 3 |
| 1755 | 06/07 | None | 1990 | 23 |
| 1745 | 06/07 | None | 1988 | 33 |
| 1735 | 06/07 | None | 1989 | 21 |
| 1730 | 06/07 | None | 1988 | 26 |
| 1720 | 06/06 | None | 1989 | 36 |
| 1715 | 06/06 | None | 1988 | 30 |

There are 15 beach survey monuments located on Fripp Island. Most recent profile data was collected at most of these stations during July 2005 and June 2007. Station 1700, on Skull Inlet, is sheltered from the open ocean and shows virtually no change from year to year. Stations 1715 through 1735 face the Atlantic Ocean along the southern half of Fripp Island. The beach width is narrower here, and at high tide there is little to no dry sand seaward of the substantial rock revetment. This beach is also fairly stable, and from June 2004 to July 2005 the profile data shows only minor changes on the intertidal beach. Between July 2005 and June 2007, the beach continued to be stabilized in this area. The beach condition changes at station 1745, on Winter Trout Rd. Northeast of here and up to station 1760 at house #763 on Marlin Drive, the beach has been strongly accretional in recent years. A large offshore sand shoal attached to the shoreline here in 2004, and as a result the beach gained a tremendous amount of sand. This section of beach is hundreds of ft wider than along the southern half of the island. At station 1745 the dune field is over 200 ft wide but actually decreased in width by about 50 ft from 2004 to 2005 and by another 50 ft between 2005 and 2007. Station 1750 on Seahorse Drive showed a similar trend. The apex of the shoal attachment was located at station 1755 on Tautog Drive, where the increase in beach width reached a maximum. The northeastern limit of the sand shoal attachment is located at station 1760, near house 763 Marlin Drive, where the beach width decreased considerably since shoal attachment. However, between 2005 and the 2007 survey year, the dune has increased in height by four ft and the beach has widened considerably.

Stations 1765 to 1790, on the northeastern end of the island, are the last two monitoring stations that face the Atlantic Ocean. During the mid-1990's a massive sand bar attached onto the beach here, increasing the beach width by hundreds of ft, but during the late 1990's that sand was eroded away. At present the beach is very narrow, with no dry-sand beach seaward of the revetment at high tide and very little beach even at low tide. The final two monitoring stations on Fripp Island are 1795 and 1798, located on Fripp Inlet. These stations show typical inlet profiles—very steep, no dry-sand beach, and only minor changes from year to year.

Hunting Island

Hunting Island is a state park located between Fripp Island and Harbor Island. The island has historically been very erosional, with long-term rates ranging from -7 up to -15 ft per year. Short-term erosion rates over the past few years have been even higher. The central portion of the island is a standard zone, while the southern end along Fripp Inlet is an unstabilized inlet zone and the northern end along St. Helena Sound is an inlet zone stabilized by an 800-ft terminal groin. Hunting Island has been renourished several times in the past 20 years, and was in a critically eroded state prior to the latest renourishment project in 2006. Six new groins were constructed as part of this project.



Figure 5. Station numbers for Hunting Island.

Table 4. Beach profile data for Fripp Island

| Benchmark | Profiles Collected in 2007 | Profiles Collected in 2006 | First Survey Year | Total Profiles |
|------------------|---------------------------------------|---------------------------------------|--------------------------|-----------------------|
| 1895 | 06/07 | None | 1988 | 19 |
| 1890 | 06/07 | None | 1988 | 17 |
| 1880 | 06/07 | None | 1988 | 20 |
| 1870 | 06/07 | None | 1988 | 18 |
| 1860 | 06/07 | None | 1988 | 23 |
| 1850 | 06/07 | None | 1988 | 29 |
| 1840 | 06/07 | None | 1988 | 27 |
| 1830 | 06/07 | None | 1988 | 34 |
| 1820 | 06/07 | None | 1988 | 29 |
| 1810 | 06/07 | None | 1988 | 20 |
| 1800 | 06/07 | None | 1988 | 10 |

The 11 beach monitoring stations on Hunting Island are unique in that their identification numbers increase from north to south. The most recent surveys, conducted during June and December 2004 and then again in June 2007, show that the beach at Hunting Island continues to wash away. Almost all stations experienced erosion, typically ranging in magnitude from 10 to 50 ft where surveyed. Erosion was slightly less at the northern end of the island, at station 1800, which benefits from the stabilizing effect of the terminal groin about 500 ft to the north.

With the exception of the extreme southwest and northeast ends of the island there are no sand dunes or high-tide beach at Hunting. Instead, the subtropical maritime forest vegetation literally falls off into the ocean, creating a bone yard of trees trunks and overturned root systems on the beach.

In order to protect Cabin Road, the beachfront access road to the southern end of the island and the houses located there, the US Army Corps of Engineers has conducted two Emergency Shoreline Protection Projects over the past few years along a 2,500 ft section of beach where the road is threatened. This work involves dredging about 250,000 cubic yards of sand from Fripp Inlet and pumping it onto the beach at Cabin Road. In addition to this work the SC Dept. of Parks, Recreation and Tourism, as owner of the island, constructed a large-scale renourishment project in 2006 that placed 570,000 cubic yards of sand on the beach.

Harbor Island

Harbor Island is located between Hunting Island and Johnson Creek to the southwest and St. Helena Sound to the northeast. Beachfront development is primarily single-family residential, with a few condominium buildings. The entire island is classified as an unstabilized inlet zone, and while the shoreline is very dynamic it is generally accretional in the long term. The beach width decreases dramatically from south to north. There are a total of six beach monitoring stations on Harbor Island. Beach survey data was not collected here during the past year, so comments on the relative condition of the beach are based on recent qualitative field observations.



Figure 6. Station numbers for Harbor Island.

Stations 1900 and 1930 are located at the southern end of the island, where the beach is wide and the long-term trend is accretional. Station 1900 is located closest to Johnson Creek and the beach profile here is extremely wide, over 2,000 ft. A series of intertidal sand bars and troughs are constantly shifting back and forth in this area, changing the shape of the lower beach profile. At present a moderate-sized sand bar located offshore at the heel of the island is in the process of welding onto the intertidal

beach. At station 1930, near the multi-family units, the beach sand volume is also greater than average and the profiles appear to be accretional. The northern end of the offshore sand bar is located just southwest of this station.

The beach width narrows significantly to the north at stations 1960 and 1980, on Harbor Island Drive North. The beach here goes through cycles of erosion and accretion that typically last for a few years. It was erosional during the late 1990's, stabilized in 2001, accreted some during 2002, and now appears to be somewhat erosional again. There is still no sand dune here, no dry-sand beach, and the high-tide swash line comes very close to several houses. At station 1995, located where the shoreline begins to curve onto St. Helena Sound, the dune field is wider, with a series of small, well-vegetated dunes. The intertidal beach is fairly narrow but this is typical of an inlet vs. open-coast shoreline. This section appears to be accreting. Station 1998 is also located within the lower wave energy environment of St. Helena Sound, so that the beach profile drops off fairly rapidly. The beach here shows only minor changes from year to year and is stable at present.

Edisto Beach

Edisto Beach is a barrier island situated between the South Edisto River and Jeremy Inlet. The northeastern portion of Edisto Beach is a state park, which includes camping sites, while the remainder of the island is primarily single-family residential. An extensive groin field on the island serves to stabilize the shoreline position. South of station 2160 (Marianne St.), the island is classified as an unstabilized inlet zone and is slightly accretional. The rest of the island, including the state park, is a standard zone and with low long-term erosion rates but an extreme lack of sand. There are 27 beach survey monuments on Edisto Beach, which were surveyed in August 2004, July 2005, November 2006, and December 2007.



Figure 7. Station numbers for Edisto Beach.

Table 5. Beach profile data for Edisto Beach.

| Benchmark | Profiles Collected in 2007 | Profiles Collected in 2006 | First Survey Year | Total Profiles |
|------------------|-----------------------------------|-----------------------------------|--------------------------|-----------------------|
| 2230 | 12/05 | 11/29 | 1988 | 37 |
| 2200 | 12/05 | 11/29 | 1988 | 35 |
| 2198 | 12/05 | None | 1998 | 4 |
| 2195 | 12/05 | 11/29 | 1988 | 36 |
| 2193 | 12/05 | 11/29 | 1990 | 31 |
| 2190 | 12/05 | 11/29 | 1988 | 34 |
| 2185 | 12/05 | 11/29 | 1990 | 32 |
| 2180 | 12/05 | 11/29 | 1988 | 36 |
| 2178 | 12/05 | 11/29 | 1990 | 31 |
| 2173 | 12/05 | 11/29 | 1990 | 30 |
| 2170 | 12/05 | 11/29 | 1988 | 23 |
| 2165 | 12/05 | 11/29 | 1990 | 21 |
| 2160 | 12/05 | 11/29 | 1988 | 22 |
| 2155 | 12/05 | 11/29 | 1990 | 19 |
| 2150 | 12/05 | 11/29 | 2006 | 1 |
| 2145 | 12/05 | 11/29 | 2006 | 1 |
| 2135 | 12/05 | 11/29 | 2006 | 1 |
| 2130 | 12/05 | 11/29 | 2006 | 1 |
| 2120 | 12/05 | 11/29 | 2006 | 1 |
| 2113 | 12/05 | 11/29 | 2006 | 1 |
| 2110 | 12/05 | None | 1988 | 22 |

Stations 2110-2130 are located along the South Edisto Inlet shoreline. These stations are sheltered from the open ocean and generally experience only modest seasonal changes on the intertidal beach. Stations 2135 at Edisto Street and 2140 at Billow Street are located on The Point, the shoreline curve between the South Edisto River and the Atlantic Ocean. Historically this section of beach can be very dynamic but has remained stable in recent years. The upper beach has accreted between 50 and 100 ft since the 2006 survey on the southern point, but the profiles around the point on the oceanfront are eroding.

The oceanfront southern half of Edisto Beach, from stations 2145 to 2165, has the widest oceanfront beach on Edisto. Most stations here experienced only minor seasonal changes through July 2005. The 2006 renourishment to this section of Edisto added a 100-ft berm, which eroded 10 to 25 ft between 2006 and 2007.

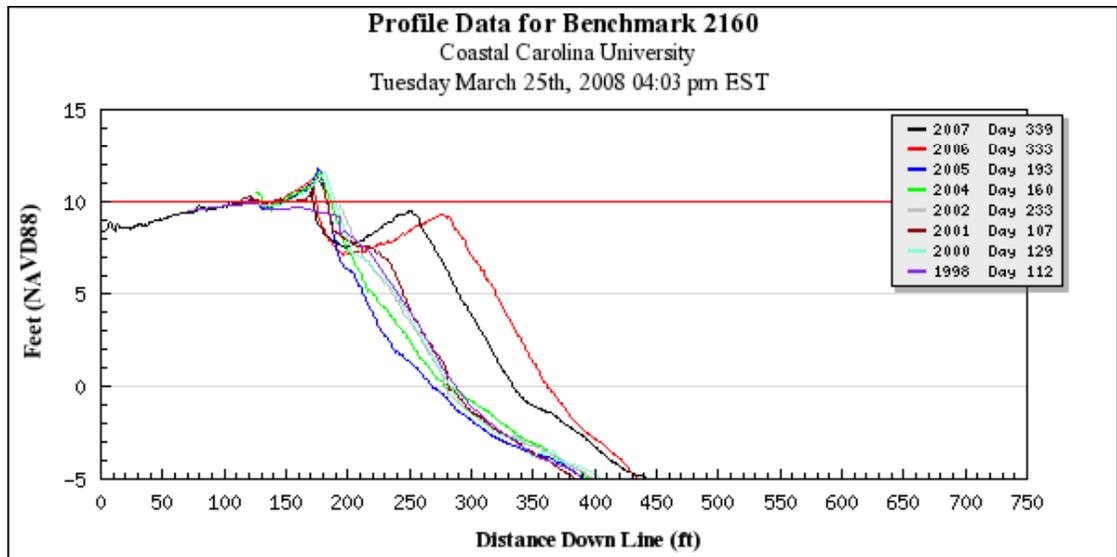


Figure 8. Beach profiles for Station 2160 on Edisto Beach.

The northern half of developed Edisto Beach, from station 2170 to station 2200 at the Pavilion, was one of the most critically eroded sections of beach anywhere in the state until the 2006 renourishment. All stations in this reach generally suffer from a considerable sand deficit and until the renourishment had virtually no beach at high tide and no protective dune between the ocean and the development. Prior to renourishment, many houses in this area were located on the active beach, with ocean water surging up under the house pilings during extreme high tides. This area did not experience much erosion through July 2005, but was hit hard by Tropical Storm Tammy in early October 2005.

From the renourishment a substantial beach was created with 100+ ft of berm in most places. From station 2155 through 2173, 15 to 20 ft of erosion occurred between the 2006 and 2007 survey. Slight accretion between station 2178 and 2180 occurred within the current study year, with erosion of 10 to 20 ft between stations 2190 and 2230. Stations 2200 to 2230 in Edisto Beach State Park are comparable to the northern half of Edisto Beach. Beach width is minimal, the dune is maintained by periodic sand scraping, and the campsites and access roads in the park still remain very vulnerable to erosion.

Seabrook Island

Seabrook Island is a barrier island approximately 4 miles long, situated between North Edisto Inlet and Captain Sams Inlet. Development on the island is a mix of single-family and multi-family structures. A continuous 5,000-ft section of shoreline is armored with rock revetments and a few seawalls. The entire island is classified as an inlet zone—the armored portion is a stabilized inlet zone, while the remainder is unstabilized. Shoreline change patterns have been quite dynamic over the past 50 years with long-term erosion rates of -2.6 ft per year along the revetment and a “stable” rate to the northeast. There are 11 beach monitoring stations on Seabrook Island. Three of them, stations 2545, 2565, and 2570, were surveyed during June 2004, September 2005, and March 2007.



Figure 9. Station numbers for Seabrook Island.

Table 6. Beach profile data for Seabrook Island.

| Benchmark | Profiles collected in 2007 | Profiles collected in 2006 | First Survey Year | Total Profiles |
|------------------|-----------------------------------|-----------------------------------|--------------------------|-----------------------|
| 2570 | 03/21 | None | 1998 | 6 |
| 2565 | 03/21 | None | 1998 | 6 |
| 2545 | 03/21 | None | 1998 | 6 |

Station 2515, at Beach Club Villas along the North Edisto River, is a typical inlet profile—very steep and fairly stable. Stations 2520 through 2540 are located along the revetment, from the Beach Club to Renken Point. This section of Seabrook Island has lacked a dry-sand beach for many years, but the artificial movement of sand to this area from the intertidal portion of the beach to the north has corrected this situation and a minimal dry-sand beach now exists. In addition, changes to the northern marginal flood channel of the North Edisto River are benefiting the beach. The channel has historically been fairly deep and pinched in very close to the shoreline, creating a steep profile and making it difficult to retain a dry-sand beach, but within the past few years the channel has filled in, decreasing in depth from -20 ft to -5 ft. As this trend continues it will be easier to maintain a dry-sand beach seaward of the revetment here.

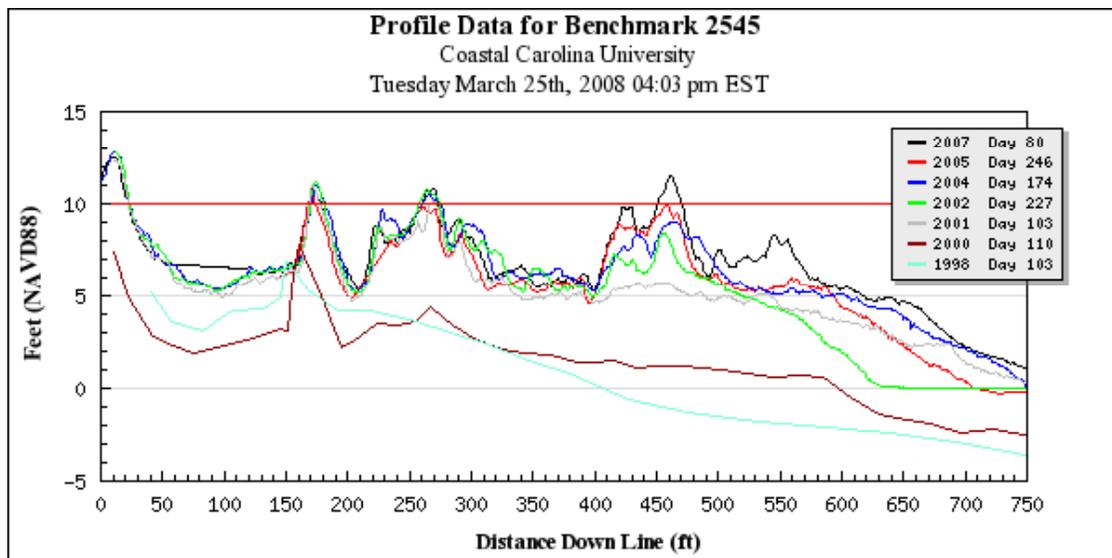


Figure 10. Beach profiles for station 2545 on Seabrook Island.

In the North Beach area, from station 2545 to 2575, the high-tide beach averages over 500 ft in width. This area is closer to Captain Sam's Inlet and its nearness to the inlet causes the shoreline to be more dynamic, experiencing episodes of moderate erosion or accretion from one year to the next. However, the substantial width of the dry-sand beach makes these changes of less concern than they might be elsewhere. In 2005 station 2545, near Cobia Court, showed a stable dune field and moderate changes on the intertidal beach. This trend continued into 2007, with the formation of an additional small dune 100 ft seaward of the 2005 dune. At station 2565 near Seascape Court the dune was stable but the beach seaward of the dune eroded back about 100 ft. Station 2570 off Oyster Catcher Court experienced some dune erosion and also lost about 75 ft of beach seaward of the dune from 2004 to 2005, while the region between 0 and 5 ft in elevation eroded on average 30 ft.

Kiawah Island

Kiawah Island is a ten-mile long barrier island, located between Seabrook Island and Captain Sams Inlet to the west, and Stono Inlet and Folly Beach to the east. Kiawah is one of the most stable barrier islands in the state, although the eastern and western ends of the island are more dynamic due to their proximity to inlets. Most oceanfront development here is single-family residential, although there are some multi-family residential buildings, commercial structures, a golf course, and a public park. The long-term erosion rate averages a half-ft per year for most of the island.



Figure 11. Station numbers for Kiawah Island.

Table 7. Beach profile data for Kiawah Island.

| Benchmark | Profiles Collected in 2007 | Profiles Collected in 2006 | First Survey Year | Total Profiles |
|------------------|-----------------------------------|-----------------------------------|--------------------------|-----------------------|
| 2775 | 03/19 | None | 2001 | 2 |
| 2765 | 03/19 | None | 1999 | 5 |
| 2760 | 03/19 | None | 1999 | 5 |
| 2755 | 03/19 | None | 2001 | 1 |
| 2750 | 03/19 | None | 1998 | 6 |
| 2735 | 03/19 | None | 1998 | 5 |
| 2730 | 03/19 | None | 1998 | 7 |
| 2725 | 03/19 | None | 1998 | 7 |
| 2720 | 03/19 | None | 1998 | 7 |
| 2715 | 03/19 | None | 1998 | 7 |
| 2705 | 03/19 | None | 1998 | 7 |
| 2700 | 03/19 | None | 1998 | 6 |
| 2695 | 03/19 | None | 1998 | 7 |
| 2690 | 03/19 | None | 1998 | 7 |
| 2685 | 03/19 | None | 1998 | 7 |
| 2680 | 03/19 | None | 1998 | 6 |
| 2675 | 03/19 | None | 1998 | 7 |
| 2665 | 03/20 | None | 1998 | 5 |
| 2660 | 03/20 | None | 1998 | 7 |
| 2645 | 03/20 | None | 1998 | 7 |
| 2640 | 03/20 | None | 1998 | 7 |
| 2635 | 03/20 | None | 1998 | 6 |
| 2630 | 03/20 | None | 1998 | 6 |
| 2625 | 03/20 | None | 1998 | 6 |

Eighteen beach monitoring stations on Kiawah Island were most recently surveyed in June 2004, May and June 2005, and March 2007. Stations 2615 through 2645 are located at the western end of Kiawah, where land use consists of undeveloped property, a beach park, single-family homes, and some multi-family structures. This is usually one of the most stable sections of Kiawah Island. For all stations here the primary dune was stable and the beach profile seaward of the dune showed either no change or minor accretion. Some of the 2007 profiles document the formation of a small dune twenty ft seaward of the 2005 shoreline.

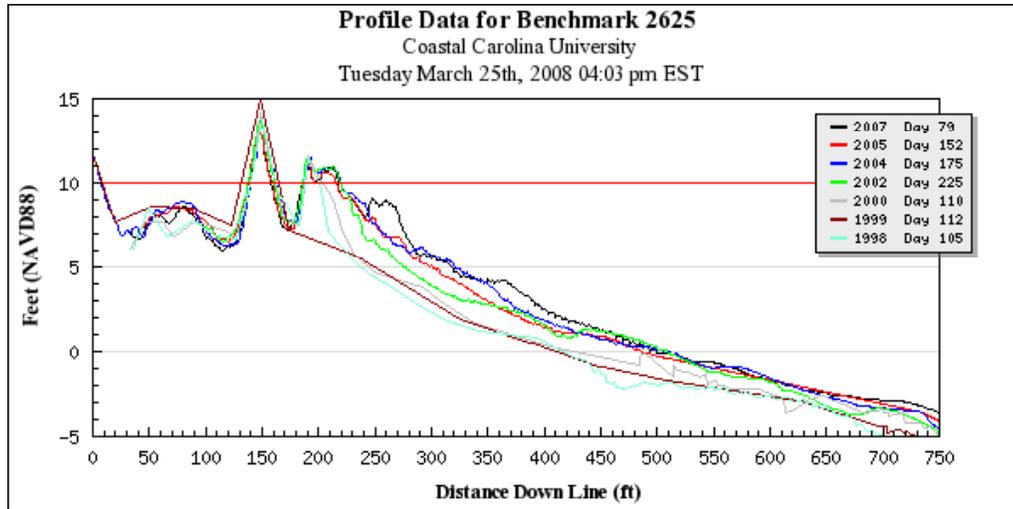


Figure 12. Beach profiles for station 2625 on Kiawah Island.

The area from station 2660, near the middle of Eugenia Ave., through station 2680, at the eastern end of Windswept Villas, experienced significant erosion in 1995 and 1996, stabilized from 1997 through 1999, became erosional again in 2000 and 2001, and was accretional between 2002 and 2004. Through March 2007 the dune field was stable but the beach seaward of the dune showed minor erosion. Other stations to the northeast, from 2685 on Turtle Beach Lane to 2735 at the Kiawah Beach Club, also showed a stable dune and minor changes seaward of the dune.

The condition of the beach changes along the Ocean Course golf course, from station 2745 to 2780, which historically has been the most unstable section of Kiawah Island. Station 2750 experienced dune scarping and about 50 ft of erosion seaward of the dune from 2004 to 2005, with continued erosion through 2007. Station 2755 exhibited a loss of the 2001 dune, with a substantial longer-term accretion of the beach. Erosion at 2760 near the 18th fairway and 2765 near the Clubhouse continued in the upper beach, but the lower beach built up significantly between +5 and -5 ft. The erosion at stations 2775 and 2780, where emergency sand scraping was repeatedly performed during the fall of 2005, was alleviated with the large volume of sand artificially placed on the beach as shown in the 2007 survey data. The last two Kiawah Island monitoring stations, 2785 and 2790, are located along the Stono Inlet shoreline far from any development and were not surveyed during 2007.

Folly Beach

Folly Beach is located between Stono Inlet and Kiawah Island to the southwest, and Lighthouse Inlet and Morris Island to the northeast. Nearly all of Folly's shoreline is armored and contains groin fields. Oceanfront development is mostly single-family residential, with one large condominium and one large hotel in the center of the island behind a seawall, a public park at the southwest end, and a large tract of undeveloped property at the northeast end near the old Coast Guard Station. Long-term erosion rates are -1 to -3 ft per year, although in recent years the northeast end of the beach has been highly erosional. The 33 monitoring stations at Folly Beach were surveyed in June 2004, January 2005, and December 2007. A major beach renourishment project placed over 2 million cubic of sand from an offshore borrow source on the beach at Folly during the summer and fall of 2005. A small renourishment project was conducted in 2007 to fortify the northeastern end of the island, from the Washout to the old Coast Guard base.



Figure 13. Station numbers for Folly Beach.

Table 8. Beach profile data for Folly Beach.

| Benchmark | Profiles Collected in 2007 | Profiles Collected in 2006 | First Survey Year | Total Profiles |
|-----------|----------------------------|----------------------------|-------------------|----------------|
| 2963 | None | None | 1990 | 17 |
| 2960 | None | None | 1988 | 20 |
| 2890 | 12/06 | 01/24 | 1988 | 22 |
| 2885 | 12/06 | 01/24 | 1988 | 26 |
| 2883 | 12/06 | 01/24 | 1988 | 29 |
| 2880 | 12/06 | 01/24 | 1988 | 31 |
| 2878 | 12/06 | 01/24 | 1988 | 29 |
| 2873 | 12/06 | 01/24 | 1988 | 30 |
| 2867 | 12/06 | 01/24 | 1990 | 17 |
| 2865 | 12/06 | 01/24 | 1988 | 28 |
| 2863 | 12/06 | 01/24 | 1990 | 27 |
| 2860 | 12/06 | 01/24 | 1998 | 10 |
| 2855 | 12/06 | 01/24 | 1988 | 28 |
| 2850 | 12/06 | 01/24 | 1988 | 32 |
| 2843 | 12/06 | 01/24 | 1988 | 28 |
| 2840 | 12/06 | 01/24 | 1988 | 23 |
| 2838 | 12/06 | 01/25 | 1988 | 28 |

| | | | | |
|------|-------|-------|------|----|
| 2835 | 12/06 | 01/25 | 1988 | 29 |
| 2833 | 12/06 | 01/25 | 1988 | 28 |
| 2832 | None | None | 1988 | 18 |
| 2830 | 12/06 | 01/25 | 1988 | 29 |
| 2828 | 12/06 | 01/25 | 1988 | 31 |
| 2825 | 12/06 | 01/25 | 1998 | 10 |
| 2823 | 12/06 | 01/25 | 1998 | 10 |
| 2820 | 12/06 | 01/25 | 1999 | 8 |
| 2818 | 12/06 | 01/25 | 1999 | 9 |
| 2815 | 12/06 | 01/25 | 1999 | 9 |
| 2813 | 12/06 | 01/25 | 2000 | 7 |
| 2810 | 12/06 | 01/25 | 1999 | 7 |
| 2805 | 12/06 | 01/25 | 1999 | 8 |
| 2803 | 12/06 | 01/25 | 1999 | 6 |

At the western end of the island in the county park, station 2803 showed significant accretion on the lower beach, while stations 2805 in the middle of the park and 2810 at the gatehouse eroded 100 and 25 ft respectively. Most other stations on the western section of Folly Beach, from station 2813 just outside the park to station 2825 at 3rd St. West, exhibited 20 to 50 ft of erosion between 2006 and 2007. Station 2828 in front of the Holiday Inn seawall was very stable but has virtually no dry-sand beach at high tide. Station 2830, immediately northeast of the seawall, was also fairly stable.

The next section of beach is the first eight blocks east of the Holiday Inn, from station 2833 up to 2843 at 8th St. East. This area has a moderate dune over or seaward of the line of rock revetments. Almost all profiles in this area were eroding during the current survey period, with a loss in the upper beach of over 75 ft in places between January 2006 and December 2007.

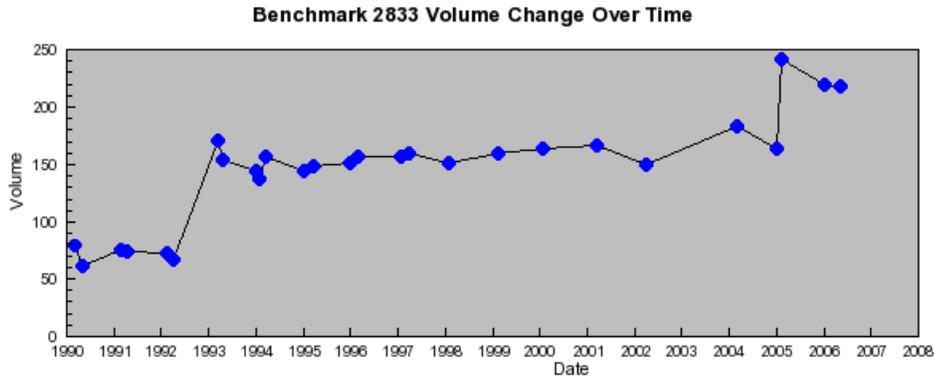


Figure 14. Change in volume of profile 2833 over time on Folly Beach. Notice the 1993 and 2005 renourishment.

The section of beach closer to the area commonly referred to as the Washout was more erosional. The dune at station 2850 at 10th St. East was relatively stable, but the upper beach in front of the dune deflated a foot and the shoreline moved landward 20 ft. At station 2855 at 12th St. East, where the dune and beach profile down to the -5' contour accreted twenty to fifty ft. Stations 2860 at 13th St. East and 2863 near the last house before the Washout showed similar accretion on the beach profile.

Stations 2865 and 2867 are located squarely in the middle of the Washout, where the ocean is closest to the road and there are no residential lots on the seaward side of Ashley Ave. Both of these stations were quite stable through January 2005, perhaps because the beach width here was already minimal in 2004 with little additional sand to be lost. Between 2006 and 2007, this section of coast gained significantly throughout the beach profile, except for movement of the dune at station 2865.

In the region from station 2873, just east of the Washout, to 2885, near the Sumter Drive beach access parking area, all stations experienced a general trend of accretion on the upper beach and intertidal beach. In most cases the dune was cut back by 20 to 25 ft. The last monitoring station, 2890 on the former Coast Guard base property, also showed considerable dune scarping and erosion on the upper and intertidal beach. The volume of sand present in the profile has steadily declined since the mid 1990's.

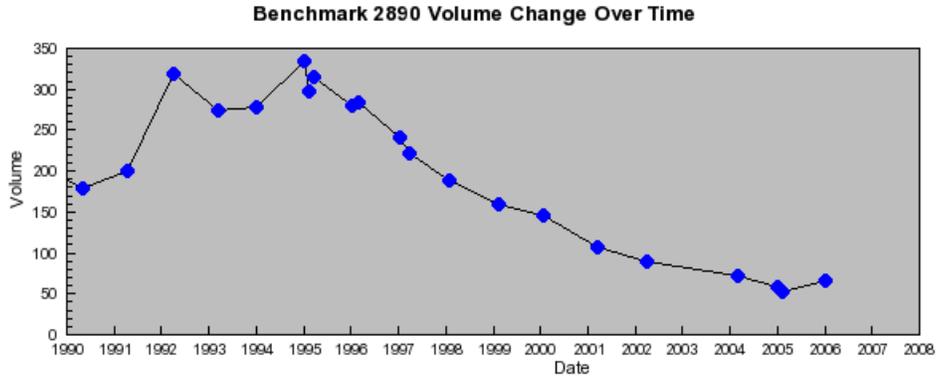


Figure 15. Change in beach profile volume through time at station 2890 on Folly Beach north of the Washout.

Based on qualitative observations of the beach from the start of the renourishment project in June 2005 through project completion in November 2005 and then in the two months following project completion, it appears the beach at the Washout and at the northeast end of Folly experienced the most rapid loss of renourishment sand, primarily due to the effects of Tropical Storm Ophelia in September 2005 and Tropical Storm Tammy in October 2005. The Army Corps of Engineers conducted a follow-up renourishment at the northeast end of Folly Beach in 2007 to replace the renourishment sand lost during these two storms.

Sullivans Island

Sullivans Island is located between Charleston Harbor and Breach Inlet. The Charleston Harbor north jetty, which comes ashore on Sullivans Island, has caused the long-term shoreline trend to be stable or accretional for much of the island. Periodic shoal attachment and movement of the channel at Breach Inlet can cause the shoreline in this region to be quite dynamic, and the long-term erosion rate here is -2 ft per year. Beach surveys were conducted at 3 of 11 monuments in the center of the island in July 2002, August 2004, and October 2006. 10 of 11 monuments were surveyed in 2007.



Figure 16. Station numbers for Sullivans Island.

Table 9. Beach profile data for Sullivans Island.

| Benchmark | 2007 | 2006 | First Survey Year | Total Profiles |
|------------------|-------------|-------------|--------------------------|-----------------------|
| 3095 | None | None | 1988 | 19 |
| 3092 | 11/13 | 10/25 | 1990 | 18 |
| 3090 | 11/13 | None | 1990 | 20 |
| 3085 | 11/13 | 10/25 | 1990 | 21 |
| 3083 | 11/13 | 10/25 | 1990 | 21 |
| 3080 | 11/13 | 10/25 | 1988 | 26 |
| 3065 | 11/13 | 10/25 | 1988 | 25 |
| 3050 | 11/13 | 10/25 | 1988 | 24 |
| 3035 | 11/13 | 10/25 | 1988 | 20 |
| 3020 | 11/13 | 10/25 | 1988 | 17 |
| 3010 | 11/13 | 10/25 | 1988 | 22 |

Survey monuments 3010-3035, between Station 16 and Station 19, are located within the Charleston Harbor north jetty. This area is extremely accretional in the long-term but has been stable to slightly erosional for the past several years. However, the tremendous beach buildup over the past century still leaves this as one of the widest beaches in South Carolina, as measured from the row of oceanfront houses out to the high-tide swash line. From 2006 to 2007, the beach here generally accreted from +5 down to 0 ft, except for station 2030 where erosion of 50 ft occurred.

Survey monuments 3050-3080 are located along the center section of Sullivans Island. The area is outside the north jetty and sand shoals from Breach Inlet periodically attach to the beach here, so that long-term trends are accretional but the shoreline is quite dynamic. The three monuments here that were surveyed in 2004, 3050 at Station 22½, 3065 at Station 26, and 3080 at Station 28, all show dune and upper-beach accretion. A sand bar 200 ft wide and 3 ft tall migrated onshore between 2006 and 2007. The long period of data collection in this region suggests an approximately ten year cycle between maximum beach widths, particularly adjacent to 3080 and 3085 and are associated with bar-welding to the beach from Breach Inlet.

Monument 3083 at Station 29 marks the transition point between the accretional center section of the island and the erosional northeastern end of the island along Breach Inlet, where the long-term erosion rate is -2 ft per year. The wide bar from 3080 can also be seen on 3083, and the dune at 3085 grew over 5 ft between surveys. The beach at 3083 has been fairly stable in recent years but the beach at 3085 near Station 30, 3090

near Station 31, and 3092 near Station 32 has been seriously eroded for several years. These survey monuments are all located close to Breach Inlet and continue to show steep and narrow inlet profiles with a sand deficit, no dune, and no high-tide beach. This 3-block section of Sullivans Island, about 2,000 ft long, is one of the most critically eroded beaches in Charleston County.

Isle of Palms

The Isle of Palms is located between Breach Inlet and Sullivans Island to the southwest, and Dewees Inlet and Dewees Island to the northeast. The island is generally accretional, primarily because the downdrift Charleston Harbor jetties interrupt the longshore flow of sand from north to south, and the official long-term shoreline change rate is stable to accretional. The northeastern end of the island, near Dewees Inlet, is extremely dynamic and can experience hundreds of feet of beach erosion or accretion over a few years. There are 22 monitoring stations on the Isle of Palms, which were surveyed in August 2004, May 2005, and October 2007.



Figure 17. Station numbers for the Isle of Palms.

Table 10. Beach profile data for Isle of Palms.

| Benchmark | 2007 | 2006 | First Survey Year | Total Profiles |
|------------------|-------------|-------------|--------------------------|-----------------------|
| 3290 | 10/25 | 10/19 | 1992 | 19 |
| 3280 | 10/25 | 10/19 | 1992 | 19 |
| 3270 | 10/25 | 10/19 | 1992 | 18 |
| 3263 | None | None | 1992 | 1 |
| 3260 | 10/25 | 10/19 | 1992 | 19 |
| 3257 | None | None | 1992 | 5 |
| 3255 | 10/25 | 10/19 | 1992 | 18 |
| 3250 | 10/25 | 10/19 | 1991 | 22 |
| 3240 | 10/25 | 10/19 | 1991 | 22 |
| 3230 | 10/25 | 10/19 | 1991 | 22 |
| 3220 | 10/25 | 10/19 | 1991 | 21 |
| 3210 | None | None | 1991 | 2 |
| 3190 | 11/12 | None | 1987 | 21 |
| 3185 | 11/12 | None | 1987 | 25 |
| 3183 | 11/12 | None | 1990 | 22 |
| 3180 | 11/12 | None | 1987 | 30 |
| 3178 | 11/12 | 10/26 | 1990 | 28 |
| 3175 | 11/12 | 10/26 | 1987 | 35 |
| 3173 | 11/12 | 10/26 | 1990 | 30 |
| 3170 | 11/12 | 10/26 | 1987 | 33 |
| 3167 | 11/12 | 10/26 | 1990 | 31 |
| 3165 | 11/12 | 10/26 | 1987 | 23 |
| 3160 | None | None | 1987 | 21 |
| 3159 | 11/12 | 10/26 | 1990 | 28 |
| 3157 | 11/12 | 10/26 | 1990 | 28 |
| 3155 | 11/12 | 10/26 | 1996 | 15 |
| 3150 | 11/12 | 10/26 | 1987 | 30 |
| 3145 | 11/12 | 10/26 | 1987 | 22 |
| 3140 | 11/12 | 10/26 | 1996 | 15 |
| 3135 | 11/12 | 10/26 | 1987 | 30 |
| 3130 | 11/12 | 10/26 | 1987 | 24 |
| 3125 | 11/12 | 10/26 | 1987 | 28 |
| 3120 | 11/12 | 10/25 | 1987 | 32 |
| 3115 | 11/12 | 10/25 | 1987 | 28 |
| 3110 | 11/12 | 10/25 | 1987 | 30 |
| 3105 | 11/12 | 10/25 | 1990 | 20 |
| 3100 | 11/12 | 10/25 | 1987 | 24 |

Stations 3100-3110, from Breach Inlet to 3rd Ave., are influenced by the inlet's channels and shoals and are usually more dynamic than the central portion of the island. This area is strongly accretional in the long term but exhibited strong dune scarping and erosion the previous year.

Stations 3115-3155, from 6th Ave. to the Citadel Beach Club, are located along the more stable portion of shoreline in the center of the island. Beach profiles here typically show a well-defined primary sand dune and only minor to moderate seasonal variations from year to year. This area was slightly accretional during the past year, with

stations 3155 at the Citadel Beach Club and 3157 near 50th Ave. experiencing the most dune and upper beach accretion.

Beginning at station 3159 near 53rd Ave. and continuing on into Wild Dunes, beach profiles are close enough to Dewees Inlet to be effected by periodic bar bypassing from the inlet shoal complex, and as a result profiles here are more dynamic than the rest of the island. These shoal attachment episodes cause extreme accretion in the area of shoal attachment and severe but localized erosion immediately adjacent to the attachment site. These shoal attachment episodes generally occur about every 6-8 years and last about 18 months, with one event terminating in the fall of 1996 and another ongoing at the end of 2007.

Station 3159 near 53rd Ave. and 3165 near 57th Ave. were fairly stable through May 2005, but the dynamics of the inlet-dominated shoreline became apparent beginning at station 3167, at the southwest end of Beachwood East, which was erosional through May 2005. In the current report year, these areas experienced a mix of erosion in the upper beach and accretion lower in the profile below 0 ft. Stations 3170 and 3173 experienced accretion in the +5 ft berm, with bar accumulation between the 0 and -5 ft contour. In the previous study year, station 3170 at the northeast end of Beachwood East and 3173 near the Property Owners Clubhouse both gained sand on the entire beach profile from the +4 ft contour down to the -8 ft contour. Accretion occurred at station 3175 near Mariners Walk from May 2005 through December 2007, while severe erosion across the upper beach occurred at station 3178 and 3180. The erosion worsened at the last two stations on the Isle of Palms. Both station 3178 near SummerHouse condominiums and station 3180 at Port O'Call condominiums lost approximately 100 ft of beach between August 2004 and May 2005, and another 50 ft through December 2007. The continued loss of sand here makes this the most severely eroded beach in the state.

Dewees Island

Dewees Island is located between Dewees Inlet to the southwest, and Capers Inlet to the northeast. The island is approximately two miles long, and is classified as an unstabilized inlet zone. The shoreline is very dynamic, with long-term erosion rates of -3 to -12 ft per year, although in recent years the entire island has been accreting. There is limited single-family development here. There are 9 monitoring stations on Dewees Island, which were most recently surveyed in October 2005, October 2006, and October 2007.

Station 3220 is located on top of a bluff along Dewees Inlet. The beach here can be very dynamic but was fairly stable and showed only minor accretion at the seaward end of the profile.

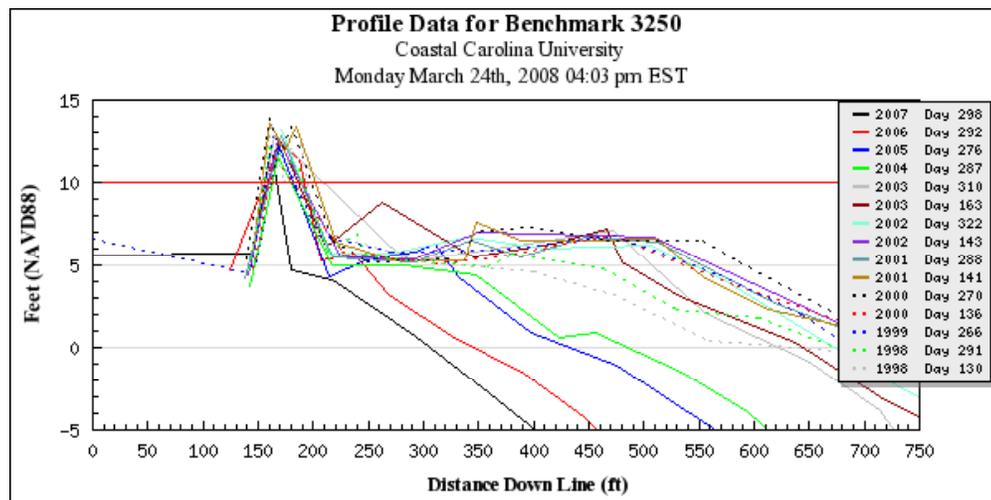


Figure 18. Profile data for station 3250 on Dewees Island.

Along the developed southern half of Dewees, station 3220 showed significant accretion through October 2006. Stations 3230, 3250, and 3255 all experienced some erosion at the seaward end of the profile, between the 0 and -5 ft contours, but maintained a net increase in sand across the entire profile. Station 3240 has experienced continuous loss in the profile since 2002, with a landward shift in the berm between 2004 and 2005 and relative stability into October 2006.

Along the undeveloped northern half of Dewees Island, station 3260 showed slight erosion just seaward of a sizable primary dune, while 3270 showed slight erosion along this same portion of the profile. Station 3280 is closer to Capers Inlet and has a very wide profile that extends several hundred ft offshore. This station showed slight erosion from 2005 to 2006. The last monitoring station, 3290, is located on Capers Inlet. The primary dune here is usually quite stable, while seaward of the dune a large sand flat, most of it intertidal, extends offshore for hundreds of ft. During the past year the primary dune was again very stable and the large offshore sandbar that attached to the beach here the previous year has exhibited little change.

Debidue Beach

Debidue Beach, located between North Inlet and Pawleys Inlet, is the southernmost of the Grand Strand beaches. The central portion of Debidue is armored with a continuous 4,500-ft long bulkhead. The area south of the bulkhead has experienced long-term erosion rates of -8 to -12 ft per year, while the area north of the bulkhead is stable to accretional. The southern half of Debidue Beach was renourished in the spring of 2006. The northerly most stations here were surveyed in June 2006 and May 2007.



Figure 19. Station numbers for DeBordieu Beach.

Table 11. Beach profile data for DeBordieu Beach.

| Benchmark | 2007 | 2006 | First Survey Year | Total Profiles |
|------------------|-------------|-------------|--------------------------|-----------------------|
| 4180 | 05/31 | 06/28 | 1987 | 34 |
| 4170 | 05/31 | 06/28 | 1987 | 31 |
| 4160 | 05/31 | 06/28 | 1987 | 32 |
| 4150 | 05/31 | 06/28 | 1987 | 32 |
| 4140 | 05/31 | 06/28 | 1987 | 36 |
| 4130 | 05/31 | 06/28 | 1987 | 28 |

| | | | | |
|------|-------|-------|------|----|
| 4125 | 05/31 | 06/28 | 1987 | 24 |
| 4120 | 05/31 | None | 1987 | 21 |
| 4115 | None | 06/28 | 1987 | 29 |
| 4110 | None | None | 1987 | 4 |
| 4105 | None | None | 1987 | 4 |
| 4100 | None | None | 1987 | 17 |

At station 4115, located near the southern end of the maritime forest closest to North Inlet, the upper beach has continued to erode and cut back by about 10’ during the past year. At station 4125, about 1,000 ft south of the bulkhead, the long-term trend is erosional. The beach profile collected in June 2006 shows the wedge of renourishment material merging with the shoreface at -5' and extending the beach approximately 125' seaward. Since 2006, the renourishment wedge has eroded an additional 30 to 40 ft from the +7 to 0 ft contour. At the south end of the bulkhead, station 4130 reflects the creation of a larger dune and extension of the profile seaward almost 200' due to the renourishment in 2006, with a retreat of approximately 75 ft through May 2007. This south bulkhead section of beach has historically been the most critically sand-starved beach profile at Debidue.

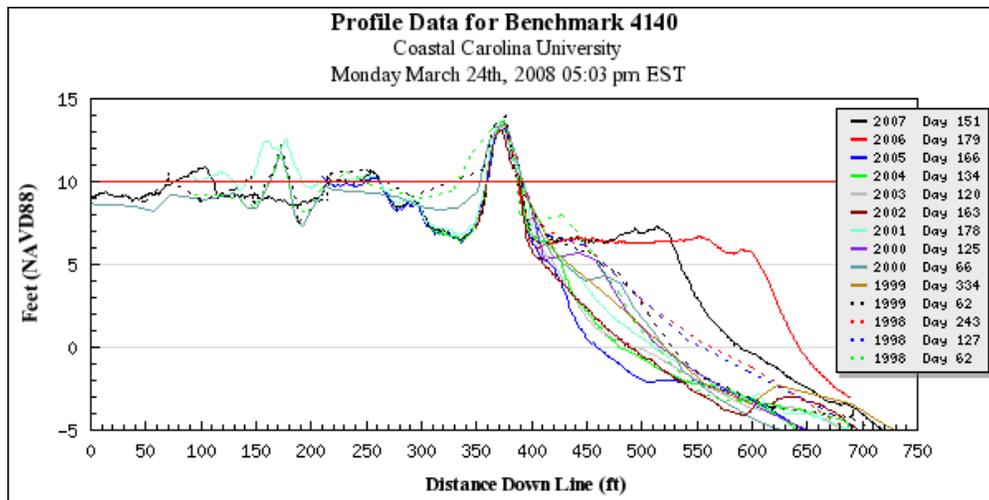


Figure 20. Beach profiles for station 4140 on DeBordieu Beach. Note the 2006 renourishment and landward migration through 2007.

Station 4140, near the northern end of the bulkhead, is the “pivot point” on Debidue—the beach typically erodes to the south and accretes to the north. During the

previous year this station saw erosion between the +7 ft and -2 ft contours, as the beach cut back by up to 25 ft. The renourishment project added approximately 200' of beach to the profile with approximately 68 cubic yards of fill material per ft of beach. Between June 2006 and May 2007, 70 ft of beach has been lost and the profile steepened. A similar loss is noted at station 4150.

Stations 4150-4180 are located north of the bulkhead. This is a mostly undeveloped area with an extensive dune field, and historically the beach is usually quite stable. From May 2004 through June 2005, and also through May 2006 the dune field here once again remained unchanged. Station 4150 also received renourishment sand, extending the profile 150' seaward. Station 4160 experienced some minor berm and upper beach accretion from the renourishment spillover, while 4170 experienced some accretion on the berm and lower beachface.



Figure 21. Aerial photograph of DeBordieu Island near station 4130.

Pawleys Island

Pawleys Island is located between Pawleys Inlet and Midway Inlet. Groin fields on Pawleys have counteracted a slight erosional trend to produce a stable shoreline with an official long-term erosion rate of zero, although recent studies indicate a more accurate rate may be -2.8 ft/yr of erosion. The southern portion of Pawleys is low-lying, with little or no sand dunes. The central portion has some of the highest dunes in the state, while the northern, accretional end has a wide field of low dunes. A beach renourishment project using sand borrowed from the sand spit at the southern end of the island was completed in 1999. Fifteen monitoring stations at Pawleys were surveyed in May 2007, fourteen in July 2006 and twelve in June 2005.



Figure 22. Location of benchmarks and stations for Pawleys Island area.

Table 12. Benchmark data for Pawleys Island

| Benchmark | Profiles collected in 2007 | Profiles collected in 2006 | First Survey Year | Total Profiles |
|------------------|-----------------------------------|-----------------------------------|--------------------------|-----------------------|
| 4295 | None | None | 1987 | 22 |
| 4290 | 05/30 | 07/06 | 1987 | 32 |
| 4285 | 05/30 | 07/06 | 1990 | 31 |
| 4280 | 05/30 | 07/06 | 1987 | 19 |
| 4275 | 05/30 | 07/06 | 1989 | 31 |
| 4270 | 05/30 | 07/06 | 1987 | 28 |
| 4260 | 05/30 | 07/06 | 1987 | 34 |
| 4245 | 05/30 | 07/06 | 1987 | 37 |
| 4240 | 05/30 | None | 1989 | 25 |
| 4230 | 05/30 | 07/06 | 1987 | 28 |
| 4220 | 05/30 | 07/06 | 1989 | 33 |
| 4215 | 05/30 | 07/06 | 1987 | 34 |
| 4210 | 05/30 | 07/06 | 1989 | 30 |
| 4205 | 05/30 | 07/06 | 1987 | 37 |
| 4203 | 05/30 | 07/06 | 1989 | 29 |
| 4200 | 05/30 | 07/06 | 1987 | 31 |

While there are no monitoring stations at the southern end of the island, it is apparent from visual observations that the dune in the public parking area has been chronically eroded for the past few years, and the southernmost groin cell, where the last 13 houses on Pawleys are located, still has no sand dune. Stations 4200-4220 are the 6 monitoring sites located north of this groin cell, in the developed, low-lying southern end of Pawleys Island. In this region station 4200 experienced some minor dune erosion, the berm at stations 4203 and 4205 had negligible change, and the other stations saw some minimal erosional and accretional changes on the intertidal beach between the +3 ft and the -5 ft contours.

The central portion of Pawleys Island, with a large primary dune, is represented by stations 4230-4280. All of the profile stations here were fairly stable, with some experiencing minor berm erosion and most gaining or losing a small amount of sand on the intertidal beach. Historically, this entire section of beach has always been the most stable portion of Pawleys Island. It shows little change from year to year, has an adequate sand volume, and, in most places, also has one of the largest sand dunes in the state. Between July 2005 and July 2006, the small runnel on the intertidal beach filled and the berm generally enlarged, increasing the total volume on the beach in this area. Erosion in the intertidal zone between 0 and +5 ft was compensated between the 0 and -5 ft contours on some profiles in the north portion of this segment of coast.

Stations 4285 to 4295 are located closest to Midway Inlet, where the beach is much wider and is generally more dynamic. The long-term trend here is accretional, and most houses are several hundred ft landward of the high-tide water line. The entire beach profile was fairly stable here in the past, with minor accretion along 4285 and 4290 and a shallowing of the profile above 0 ft at 4295 due to an inlet bar welding event (see Figure 23). Station 4285 did experience some accretion on the seaward side of the primary sand dune and erosion between 0 ft and -5 ft. Station 4290 experienced minor accretion throughout the profile down to -5 ft.



Figure 23. Northern end of Pawleys Island. A bar has migrated onto the island here (Photo Credit: Scott Harris, June 22, 2007).

Litchfield Beach/Huntington Beach State Park

Litchfield Beach, North Litchfield, and Huntington Beach State Park represent a continuous, uninterrupted sediment budget compartment. This area is bounded by Midway Inlet to the south, and Murrells Inlet to the north. The southern spit at Litchfield is a low-lying area with a small dune field, while the central portion of this reach contains a large, well-defined primary dune, one of the largest in the state. The official long-term shoreline trend is “stable” for this entire area, and in fact, Litchfield Beach and North Litchfield Beach are among the most stable beaches in South Carolina. All stations here have a significant primary dune that generally shows no sign of erosion from year to year, and changes to the beach profile are usually limited to minor sand gains or losses on the active beach seaward of the dunes. The northern reach, in the state park, is directly influenced by Murrells Inlet and the south inlet jetty.

Litchfield Beach

Litchfield Beach is covered by stations 4300 to 4495. Seven profiles were collected in April 2007, three profiles in July 2006 and seven in July 2005.



Figure 24. Benchmark locations for Litchfield Beach.

Table 13. Benchmark data for Litchfield Beach.

| Benchmark | Profiles collected in 2007 | Profiles collected in 2006 | First Survey Year | Total Profiles |
|-----------|----------------------------|----------------------------|-------------------|----------------|
| 4495 | None | None | 1987 | 20 |
| 4490 | 04/02 | None | 1987 | 35 |
| 4430 | 04/02 | None | 1987 | 31 |
| 4400 | 04/02 | None | 1987 | 31 |
| 4395 | 04/02 | None | 1987 | 32 |
| 4390 | 04/02 | 07/12 | 1987 | 31 |
| 4360 | 04/02 | 07/12 | 1987 | 30 |
| 4330 | 04/02 | 07/12 | 1987 | 33 |
| 4315 | None | None | 1988 | 21 |
| 4300 | None | None | 1992 | 12 |

During the past year data collected at stations 4330 to 4390 indicate an extremely stable dune field with slight accretion in the intertidal profile and the attachment of a small sand bar. Seaward of the dune, a moderate-size berm about 35 ft in width that formed between 2003 and May 2004 was eroded away by June 2005, as the upper-beach profile returned to its 2003 shape. From 2005 to 2006, the beach between 0 ft and -5 ft eroded, while above and below these contours accretion occurred.



Figure 25. Aerial photograph of the south end of Litchfield Beach. (Photo Credit Scott Harris, June 22, 2007)

Huntington Beach

Stations 4500-4565 are located in Huntington Beach State Park. In the southern end of the park, stations 4500, 4515, and 4525 are morphologically similar to North Litchfield Beach. They have a stable, well-defined dune and experienced some moderate changes on the intertidal beach. Station 4515 and 4525 showed accretion in the upper profile adjacent to the dune at +5 to +10 ft, while farther north stations 4545 and 4555 showed some erosion of the beach at +5 ft.



Figure 26. Benchmark locations for Huntington Beach.

Table 14. Benchmark data for Huntington Beach.

| Benchmark | Profiles Collected in 2007 | Profiles Collected in 2006 | First Survey Year | Total Profiles |
|------------------|-----------------------------------|-----------------------------------|--------------------------|-----------------------|
| 4575 | None | None | 1987 | 17 |
| 4565 | 04/02 | 07/20 | 1987 | 33 |
| 4555 | 04/02 | 07/20 | 1987 | 33 |
| 4550 | None | None | 1988 | 1 |
| 4545 | 04/02 | 07/20 | 1988 | 32 |
| 4535 | 04/02 | 07/20 | 1988 | 31 |

| | | | | |
|------|-------|------|------|----|
| 4525 | 04/02 | None | 1988 | 35 |
| 4515 | 04/02 | None | 1987 | 33 |
| 4500 | 04/02 | None | 1987 | 29 |

As proximity to Murrells Inlet increases the primary dune becomes somewhat smaller and the shoreline can become more dynamic, although the inlet itself is stabilized by jetties that were constructed in the early 1980's. At station 4535, a small dune formed 25 ft seaward of the 2005 position; however the profile exhibited erosion from +5 ft to 0 ft and accumulated below -1 ft. Stations 4545 similar erosion of the upper shoreface with a slight increase in elevation of the primary dune. Stations 4555 and 4565 were more dynamic, experiencing erosion from the seaward dune face down to the -5 ft contour and movement of the dune approximately 10 ft landward.



Figure 27. Aerial photograph of Huntington Beach State Park. (Photo Credit Scott Harris, June 22, 2007)

Garden City Beach

This section of shoreline begins at Murrells Inlet and extends northward to the southern limit of the Town of Surfside Beach. The southern half of Garden City, from station 4900 to 4955, contains few shore-protection structures, while in the northern half, between stations 4960 and 5030, seawalls and bulkheads become predominant. Generally, sand volumes are adequate in the unarmored section of Georgetown County, begin to decrease in the armored section of Georgetown County, and reach a minimum in the armored section of Horry County. The long-term erosion rate is about -1.5 ft per year. Much of Garden City was renourished in 1998 as part of the Army Corps of Engineers Grand Strand Renourishment Project, and the very southern end of Garden City, closest to Murrells Inlet, was renourished with 100,000 cubic yards of sand in 2003. There are 24 monitoring stations here, which were surveyed in May and November 2004 and March 2006.



Figure 28. Benchmark locations for Garden City.

Table 15. Benchmark data for Garden City.

| Benchmark | Profiles collected in 2007 | Profiles collected in 2006 | First Survey Year | Total Profiles |
|------------------|-----------------------------------|-----------------------------------|--------------------------|-----------------------|
| 4980 | 01/06 | 03/30 | 1987 | 41 |
| 4975 | 01/06 | 03/30 | 1989 | 30 |
| 4970 | 01/06 | 03/30 | 1987 | 37 |
| 4965 | 01/06 | 03/30 | 1989 | 31 |
| 4960 | 01/06 | 03/30 | 1987 | 37 |
| 4955 | 01/06 | 03/30 | 1989 | 30 |
| 4950 | 01/06 | 03/30 | 1987 | 36 |
| 4940 | 01/06 | 03/30 | 1988 | 34 |
| 4935 | 01/06 | 03/30 | 1989 | 34 |
| 4930 | 01/06 | 03/30 | 1987 | 36 |
| 4925 | 01/06 | 03/30 | 1989 | 32 |
| 4920 | 01/06 | 03/30 | 1987 | 39 |
| 4915 | 01/06 | 03/30 | 1989 | 35 |
| 4910 | None | None | 1987 | 25 |
| 4905 | None | None | 1989 | 20 |
| 4900 | None | None | 1987 | 26 |
| 4800 | None | None | 1989 | 1 |

Most stations in the standard zone from 4900 through 4955 are unarmored, have a well-defined dune, and historically have been fairly stable. The only exception is found along a 2,000 ft section of beach south of Pompano Drive, between stations 4910 to 4920, where the shoreline is armored and curves seaward and the beach is narrower and more vulnerable. This is the area that was renourished in 2003, and while some of this renourishment sand was quickly lost the remaining berm has stabilized and showed approximately 20 ft of loss from 7 ft to 0 ft between 2004 and 2006, with an additional loss from January to September 2007 of 5 to 10 ft of beach above the +5 ft contour. The other monitoring stations in this general area all experienced minor berm accretion but also lost sand on the lower beach between the +5 and 0 ft contours. Station 4935 showed major accumulation between +7 and 0 ft since 2004 while 4940 increased vertically approximately 2 ft between +7 and +5 ft through 2006, with 10 to 20 ft of loss above 5 ft.

North of station 4960 the shoreline is predominantly armored and the beach width decreases. Stations 4950 through 4975 have lost the berm established between +5 and 0 ft prior to 2004. Stations 4960 through 4999, in Georgetown County, and station 5000, in Horry County just south of the pier, still show a minimal dry sand beach seaward of a small dune or bulkhead.

Stations 5005 to 5035, the northernmost section of Garden City in Horry County from the pier to Melody Lane, are mostly armored and lack a dune but have a minimal dry-sand beach. Prior to the 1998 renourishment project this area had a substantial sediment deficit, and the renourishment has not performed as well here. Between May 2004 and April 2006 stations 5005 through 5035 showed significant erosion on the upper beach between the +5 and 0 ft contours. Just north of here all stations showed a continued loss of the renourishment berm, now only 40 ft wide in places, and also erosion along the entire profile out to a depth of -10 ft.



Figure 29. Aerial photograph of Garden City near Station 4970. (Photo Credit Scott Harris, June 22, 2007)

Surfside Beach and Unincorporated Horry County—South

This section of the Grand Strand includes 6 monitoring stations in the Town of Surfside Beach, and 9 stations in the unincorporated region north of Surfside Beach—the campground region, Long Bay Estates, and Myrtle Beach State Park. Surveys here were completed in November 2004, December 2005, March/April 2006, and January/February 2007. Where the beach rises against the older headland deposits, the long-term erosion rates here are around one ft per year, and in general the beach is stable in the short-term.



Figure 30. Benchmark locations for Surfside Beach.

Stations 5100 at 16th Ave. South through 5195 at 16th Ave. North fall with the Town of Surfside Beach, and almost all stations here have a well-established primary sand dune. Surfside Beach was renourished in 1998 as part of the Army Corps of Engineers Grand Strand Renourishment Project, and the project reached equilibrium within a few years. In the southern portion of Surfside Beach, from station 5100 to 5130, the beach profile experienced erosion from the +7 to the -10 ft contour during the 2004

through April 2006 period while the dune remained stable. North of here, through station 5195, the profiles all showed some minor accretion on the upper beach (+7 to +5 ft), as the berm increased in width by 20 to 30 ft in the current survey period.

Table 16. Benchmark data for Surfside Beach.

| Benchmark | Profiles collected in 2007 | Profiles collected in 2006 | First Survey Year | Total Profiles |
|-----------|----------------------------|----------------------------|-------------------|----------------|
| 5280 | 02/26 | None | 1988 | 30 |
| 5270 | 02/26 | None | 1988 | 34 |
| 5260 | 02/26 | None | 1987 | 32 |
| 5250 | 02/26 | None | 1987 | 35 |
| 5242 | None | 04/06 | 2006 | 2 |
| 5241 | None | 04/06 | 2006 | 1 |
| 5240 | 02/26 | 04/06 | 1988 | 31 |
| 5230 | 02/26 | 04/06 | 1988 | 34 |
| 5220 | 02/26 | 04/06 | 1988 | 34 |
| 5211 | None | 04/06 | 2006 | 1 |
| 5210 | 01/06 | 04/06 | 1988 | 34 |
| 5200 | 01/06 | 04/06 | 1988 | 25 |
| 5196 | None | 04/06 | 2006 | 1 |
| 5195 | 01/06 | 04/06 | 1987 | 33 |
| 5181 | None | 04/06 | 2006 | 1 |
| 5180 | 01/06 | 04/06 | 1987 | 38 |
| 5140 | 01/06 | 04/05 | 1988 | 36 |
| 5130 | 01/06 | 04/05 | 1987 | 36 |
| 5120 | 01/06 | 04/05 | 1988 | 37 |
| 5100 | 01/06 | 04/05 | 1988 | 34 |
| 5035 | 01/06 | 04/05 | 1989 | 32 |
| 5030 | 01/06 | 04/05 | 1988 | 26 |
| 5025 | 01/06 | 04/05 | 1989 | 29 |
| 5020 | 01/06 | 04/05 | 1988 | 34 |
| 5015 | 01/06 | 04/05 | 1989 | 29 |
| 5010 | 01/06 | 04/05 | 1988 | 28 |
| 5005 | 01/06 | 04/06 | 1989 | 30 |
| 5000 | 01/06 | 03/30 | 1987 | 32 |
| 4999 | 01/06 | None | 1989 | 31 |

Stations 5200 to 5240 are located in the campground section. Every station here has a well-established dune except for 5220, which is armored with a rock revetment. Through April 2006 the beach profile for 5200 and 5210 show erosion from the +5 ft contour across the entire shoreface, while the northern section of the campground exhibits erosion from 0 ft down and across the profile. The dune at station 5240 has not moved, however it did experience some loss in height.

Stations 5250 through 5270 are located in Myrtle Beach State Park. These profiles all have a well-established dune, and the beach is usually very stable. This area

was not directly renourished in 1998, although it probably received an indirect benefit from renourishment to the north and south. Surveys in January and November of 2007 show accretion on the intertidal beach around the +5 ft contour in this section.

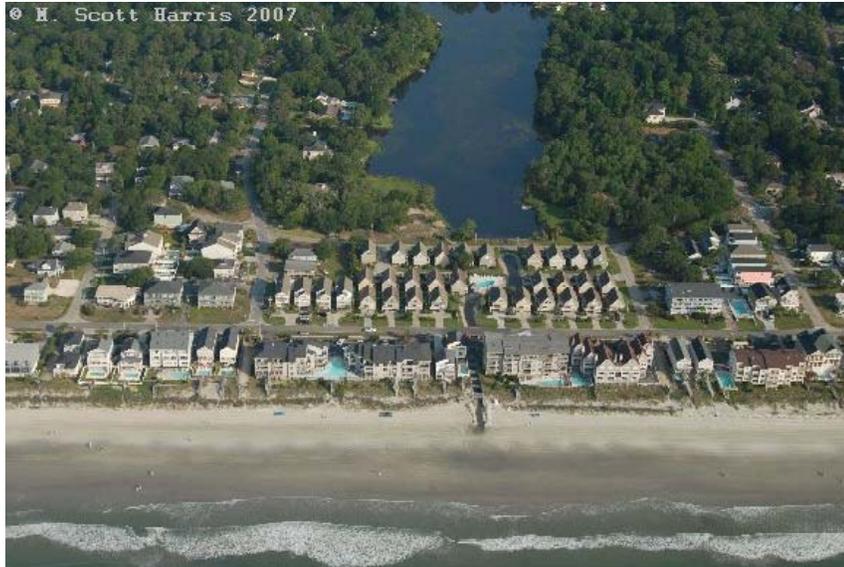


Figure 31. Aerial photograph of northern Surfside Beach. (Photo Credit Scott Harris, June 22, 2007)

Myrtle Beach

The next area is the eight-mile section of shoreline within the Myrtle Beach city limits. The long-term erosion rate here is about one-half ft per year due to its natural geologic setting against the headland. Myrtle Beach was renourished between May and December 1997 as part of the US Army Corps of Engineers Grand Strand Renourishment Project. This fill reached equilibrium within a few years, and has since stabilized. The most recent beach surveys were conducted at 46 stations in 2007, 1 station in 2006 and 23 stations in 2005.



Figure 32. Benchmark locations for Myrtle Beach.

Table 17. Benchmark data for Myrtle Beach.

| Benchmark | Profiles Collected in 2007 | Profiles Collected in 2006 | First Survey Year | Total Profiles |
|------------------|---------------------------------------|---------------------------------------|--------------------------|-----------------------|
| 5505 | 02/22 | 03/23 | 1988 | 28 |
| 5500 | 02/22 | 03/23 | 1988 | 32 |
| 5480 | 02/22 | 06/09 | 1988 | 37 |
| 5478 | 02/22 | 06/09 | 1999 | 9 |
| 5475 | 02/22 | 06/09 | 1988 | 36 |
| 5473 | 02/22 | 06/09 | 2002 | 6 |
| 5470 | 02/22 | 06/09 | 1988 | 32 |
| 5468 | 02/21 | 03/23 | 1998 | 6 |
| 5465 | 02/21 | 03/23 | 1988 | 35 |
| 5463 | 02/21 | 03/23 | 1998 | 8 |
| 5460 | 02/21 | 03/23 | 1988 | 30 |
| 5458 | 02/21 | 06/09 | 1998 | 9 |
| 5455 | 02/21 | None | 1988 | 34 |
| 5453 | 02/21 | None | 1998 | 9 |
| 5450 | 02/21 | None | 1988 | 27 |
| 5448 | 02/21 | None | 2000 | 6 |
| 5445 | 02/21 | None | 1988 | 32 |
| 5443 | 02/21 | None | 1998 | 9 |
| 5440 | 02/21 | None | 1988 | 31 |
| 5438 | 02/21 | None | 1998 | 8 |
| 5435 | 02/21 | None | 1988 | 37 |
| 5433 | 02/21 | 10/12 | 1998 | 9 |
| 5430 | 02/21 | 10/12 | 1988 | 34 |
| 5428 | 02/21 | None | 1998 | 9 |
| 5425 | 02/21 | None | 1988 | 33 |
| 5423 | 02/21 | None | 1998 | 7 |
| 5420 | 02/21 | None | 1988 | 37 |
| 5418 | 02/21 | None | 1998 | 6 |
| 5415 | 02/21 | None | 1988 | 36 |
| 5413 | 02/21 | None | 1998 | 8 |
| 5410 | 11/27 | None | 1988 | 30 |
| 5408 | 02/21 | None | 1998 | 7 |
| 5405 | 02/26 | None | 1988 | 37 |
| 5403 | 02/26 | None | 1998 | 8 |
| 5401 | 02/26 | None | 1998 | 6 |
| 5400 | None | None | 1988 | 23 |
| 5350 | 02/26 | None | 1988 | 38 |
| 5345 | 11/27 | None | 1998 | 7 |
| 5340 | 02/26 | None | 1988 | 34 |
| 5335 | 02/26 | None | 1998 | 9 |
| 5330 | 02/26 | None | 1988 | 34 |
| 5325 | 02/26 | None | 1998 | 7 |
| 5320 | 02/26 | None | 1988 | 37 |
| 5315 | 02/26 | None | 1998 | 9 |
| 5310 | 02/26 | None | 1988 | 33 |
| 5305 | 02/26 | None | 1998 | 9 |
| 5300 | 02/26 | None | 1988 | 32 |

Stations 5300-5430, from 29th Ave. South to 31st Ave. North, are located in the southern commercial district. There are many seawalls and bulkheads in this region, and

before renourishment sand volumes were relatively low. The 1997 renourishment project stabilized by 2000 and the upper beach berm has lost only a minor amount of sand since then. During the 2007 survey period almost all stations showed erosion from February to November from 0 to +5 ft countered by accretion farther up the profile from +5 to +10 ft in the upper beach. Almost all stations showed accretion on the upper beach as the berm increased in width and also grew vertically by 1 to 2 ft. Below the berm stations in the southern section of Myrtle Beach, from 5300 at 29th Ave. South to 5330 at 15th Ave. South also lost sand from the 0 to -5 ft contour, but north of here the remaining stations were fairly stable on the lower beach. In general the dry-sand berm width here is still adequate and continues to provide storm damage protection and a recreational benefit. Station 5430 showed accretion in the profile from -5 to +5 ft from fall 2005 through 2007.

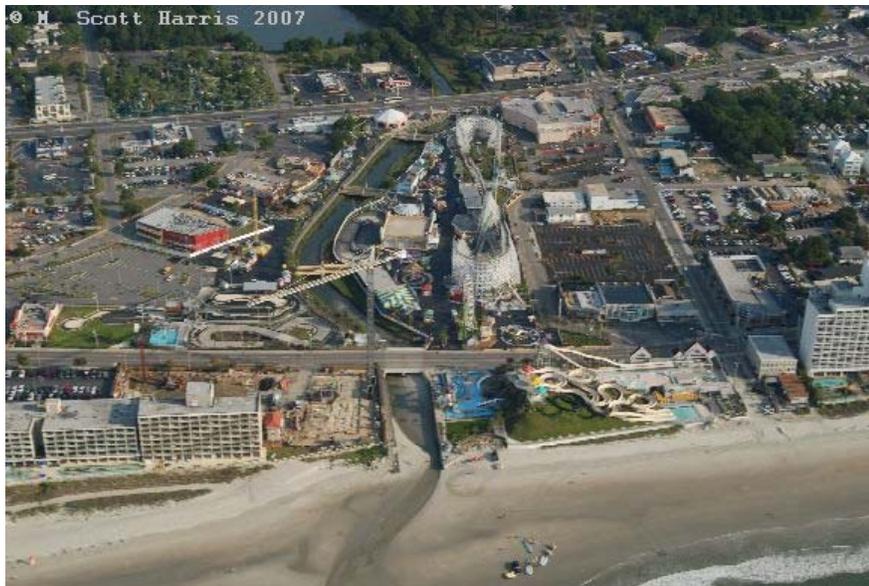


Figure 33. Withers Swash in Myrtle Beach near station 5350.

Station 5430 showed erosion between the +7 ft and -5 ft levels from January 2005 through October 2006, losing the berm on the upper beach created from 2003 to 2005, but gained during 2007 throughout the profile with a small dune of 1 to 2 ft in height.

The area between stations 5435 and 5465, from 31st Ave. North to 67th Ave. North, is primarily a residential section with some commercial sites. There are few

bulkheads or seawalls, and although a primary dune exists in many areas there are also unarmored sections where the highland, usually a residential lawn, simply slopes down to the berm. From February 2005 to February 2007, the stretch of coast between Station 5458 and 5468 exhibited a loss of the berm at approximately +7 ft, migrating landward between 20 and 40 ft and losing 2 to 3 ft elevation, but has now stabilized.

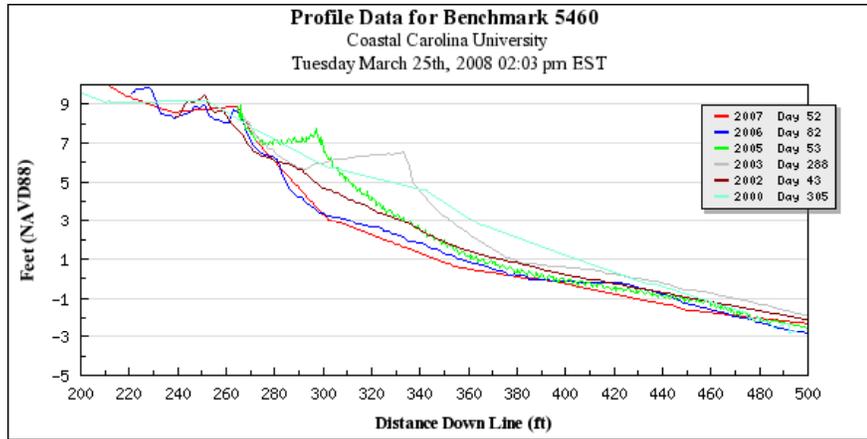


Figure 34. Beach profiles for station 5460.

Stations 5470 - 5480 are located in the northern commercial district, although there are several residential structures here as well. A small but well-defined primary dune exists along most of the beach. Surveys show the beach profile here to be eroding during 2006 similarly to the section to the south, with some accumulation of sand on the dune above the +10 ft level.

Stations 5500 and 5505 are located on Club Road, just north of the City of Myrtle Beach and south of Singleton Swash, where there is little oceanfront development. The beach here has a well-developed primary dune and the shoreline is usually quite stable from year to year. During the recent survey period, the upper beach lost approximately 1 to 2 ft of berm.

Unincorporated Horry County—North

This area of unincorporated Horry County is located between the City of Myrtle Beach and White Point Swash, and includes the Shore Drive section, Arcadian Shores, the campground section, and Briarcliffe Acres. The long-term erosion rate is about one-half ft per year. There are 14 beach survey monuments located here which were most recently surveyed in March 2005, June 2006, and February 2007.



Figure 35. Benchmark locations for the unincorporated sections of Horry County - North.

Table 18. Benchmark data for the unincorporated sections of Horry County – North.

| Benchmark | Profiles collected in 2007 | Profiles collected in 2006 | First Survey Year | Total Profiles |
|------------------|-----------------------------------|-----------------------------------|--------------------------|-----------------------|
| 5590 | None | None | 1988 | 19 |
| 5585 | 02/22 | None | 2003 | 2 |
| 5580 | 02/22 | 06/15 | 1988 | 32 |
| 5575 | 02/22 | None | 2007 | 1 |
| 5570 | 02/22 | 06/15 | 1988 | 32 |
| 5565 | 02/22 | None | 2007 | 1 |
| 5560 | 02/22 | 06/15 | 1988 | 34 |
| 5555 | 02/22 | None | 2003 | 2 |

| | | | | |
|------|-------|-------|------|----|
| 5550 | 02/22 | 06/15 | 1989 | 30 |
| 5540 | 02/22 | 06/15 | 1988 | 35 |
| 5535 | 02/22 | 06/15 | 1989 | 31 |
| 5530 | 02/22 | None | 1988 | 26 |
| 5528 | 02/22 | 06/15 | 2000 | 6 |
| 5523 | 02/22 | 06/15 | 2000 | 7 |
| 5520 | 02/22 | 06/15 | 1988 | 31 |
| 5519 | 02/22 | None | 2000 | 5 |
| 5518 | 02/22 | 06/15 | 1989 | 16 |
| 5515 | 02/22 | 06/15 | 1988 | 33 |
| 5514 | 02/22 | 06/15 | 2000 | 8 |

Stations 5510 to 5518 are located north of Singleton Swash along Shore Drive, where shoreline armoring is extensive and a dry-sand beach has generally been absent. This area was renourished by Horry County in 1999, when a 150-ft wide dry sand berm was created. The beach profile here has experienced post-project adjustment ever since, as the renourishment berm has cut back by 20 to 50 ft per year. From November 2003 through March 2005 the upper beach berm moved landward by another 30 to 40 ft. During the period between March 2005 and February 2007 the upper beach in this area consistently eroded between 10 and 20 ft, with a small accumulation of sand between +1 and -1 ft and erosion of the lower beach between -3 and -7 ft.

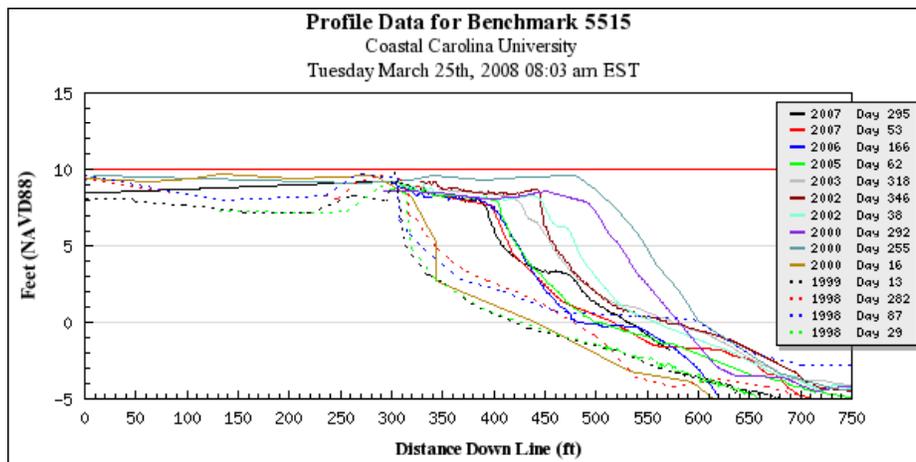


Figure 36. Beach profile data for station 5515 in unincorporated Horry County.

Stations 5520-5550 are located in the campground section, where oceanfront development is a mixture of campsites and resort hotels. Although this section was not renourished in 1999 it did receive some indirect benefits from the nearby Shore Drive renourishment project. Between the November 2003 and March 2005 surveys, most

stations here experienced 40 to 50 ft of berm erosion, and a general loss of sand along the entire profile from the berm down to the -3 or -4 ft contour. The beach has recovered in this section through the June 2006 survey, with 30 to 50 ft accretion of the beach between +7 and 0 ft. A trough recently formed between the -3 to -6 ft elevations along this portion of the coast.



Figure 37. Aerial photograph of campground, condominiums, and natural area near stations 5550 and 5560.

Stations 5560-5590 are located in Briarcliffe Acres, where the oceanfront is undeveloped and a well-defined primary dune exists with virtually no shoreline armoring. In the previous survey period, this area showed dramatic berm erosion, as the upper beach cut back by 60 ft at station 5570 and 80 ft at station 5580. During the current survey period, the beach recovered slightly, adding approximately 15 ft of berm to Station 5560, 25 ft of berm to 5570, and a negligible amount to Station 5580. The swale in the lower beach between -5 and -7 ft deepened. Across the entire profile, this section of coast had a net accumulation of sand.

North Myrtle Beach

This section includes the City of North Myrtle Beach and Atlantic Beach, from White Point Swash to Hog Inlet. The shoreline is heavily developed and much of it is armored, with alternating zones of commercial and residential structures. The beach at North Myrtle Beach is typically wider and flatter than other Grand Strand beaches. The long-term erosion rate is about a half-foot per year. North Myrtle Beach was renourished by the US Army Corps of Engineers between September 1996 and April 1997, increasing the dry-sand beach width by over 100 ft and unit-width sand volumes by over 70 cubic yards per ft. The renourishment project has since stabilized, and some of the sand still remains on the upper beach. There are 43 beach survey monuments here, which were surveyed in March 2004, January or May 2005, May 2006, and January/February 2007.



Figure 38. Location of benchmarks in the southern section of the North Myrtle Beach area.

Table 19. Benchmark data for the North Myrtle Beach area.

| Benchmark | Profiles collected in 2006 | Profiles collected in 2005 | First Survey Year | Total Profiles |
|------------------|---------------------------------------|---------------------------------------|--------------------------|-----------------------|
| 5895 | 01/30 | 05/04 | 1989 | 36 |
| 5890 | 01/30 | 05/04 | 1988 | 42 |
| 5885 | 01/30 | 05/04 | 1989 | 36 |
| 5880 | 01/30 | 05/04 | 1988 | 37 |
| 5875 | 01/30 | 05/04 | 1989 | 35 |
| 5870 | 01/30 | 05/04 | 1988 | 40 |
| 5865 | 01/30 | 05/04 | 1989 | 34 |
| 5860 | 01/30 | 05/04 | 1988 | 41 |
| 5855 | 01/30 | 05/04 | 1989 | 34 |
| 5850 | 01/30 | 05/04 | 1988 | 42 |
| 5845 | 01/30 | 05/04 | 1989 | 28 |
| 5840 | 01/30 | 05/08 | 1988 | 34 |
| 5835 | 01/30 | 05/08 | 1989 | 31 |
| 5830 | 01/30 | 05/08 | 1988 | 39 |
| 5825 | 02/02 | 05/08 | 1989 | 33 |
| 5820 | 02/02 | 05/08 | 1988 | 39 |
| 5818 | 02/02 | 05/08 | 1989 | 35 |
| 5815 | 02/02 | 05/08 | 1988 | 38 |
| 5810 | 02/02 | 05/17 | 1989 | 34 |
| 5805 | 02/02 | 05/17 | 1988 | 38 |
| 5803 | 02/02 | 05/17 | 1989 | 32 |
| 5800 | 02/02 | 05/17 | 1988 | 37 |
| 5798 | 02/02 | 05/17 | 1989 | 34 |
| 5795 | 02/02 | 05/17 | 1988 | 37 |
| 5790 | 02/02 | 05/17 | 1988 | 36 |
| 5785 | 02/02 | 05/17 | 1989 | 38 |
| 5780 | 02/02 | 05/17 | 1988 | 34 |
| 5775 | 02/02 | 05/17 | 1989 | 32 |
| 5770 | 02/02 | 05/17 | 1988 | 37 |
| 5760 | 02/02 | 05/17 | 1988 | 40 |
| 5755 | 02/02 | 05/17 | 1989 | 36 |
| 5750 | 02/02 | 05/17 | 1988 | 36 |
| 5745 | 02/02 | 05/17 | 1989 | 36 |
| 5740 | 02/02 | 05/17 | 1988 | 39 |
| 5735 | 02/02 | 05/17 | 1989 | 34 |
| 5730 | 02/02 | 05/17 | 1988 | 39 |
| 5725 | 02/02 | 05/19 | 1989 | 30 |
| 5720 | 02/02 | 05/19 | 1988 | 30 |
| 5715 | 02/02 | 05/19 | 1988 | 39 |
| 5705 | 02/02 | 05/19 | 1988 | 34 |
| 5700 | 02/02 | 05/19 | 1988 | 38 |

In the Windy Hill section, the southernmost portion of North Myrtle Beach from 48th Ave. South to 34th Ave. South where stations 5650-5720 are located, the upper beach profile was fairly stable with some dune recovery and accumulation on the upper and lower beach, and erosion on the lower beach at a few stations. In the Crescent Beach section, from 28th Ave. South to 2nd Ave. North where monitoring stations 5730 through

5798 are located, most stations experienced accretion of the profile. In the Ocean Drive section, from 2nd Ave. North to Sea Mountain Highway where stations 5800 to 5830 are located, most stations were stable to slightly erosive at the upper berm (+5 ft), with accumulation of sand between 0 and -5 ft. At many stations, the primary dune expanded seaward from just a few ft to over 15 ft.



Figure 39. Benchmark locations for the northern section of North Myrtle Beach.

In the Cherry Grove section between station 5835 at Sea Mountain Highway and 5850 at 32nd Ave. North the character of the beach changes. Much of this area is armored and experienced chronic sand deficits prior to renourishment. This same 7-block area south of the Cherry Grove pier has also experienced higher erosion rates following the renourishment project, and the beach here is currently not as wide as the beach north of the pier or south of 28th Ave. North. During the survey period from 2005 to 2006, the profile from the berm down to the 0 ft contour cut back an additional 20 to 30 ft from the previous survey period where the loss was about 20 ft. North of the pier, from station 5855 at 37th Ave. North to 5890 at 58th Ave. North, a few stations showed berm erosion

but most were stable or even accretional on the primary dune and upper beach. Station 5895 on Hog Inlet shows the formation of a new channel and migration of the berm landward 45 ft. Stations near the inlet, particularly 5885 and 5890, indicate the welding of a large bar and extension of the +5ft contour 20 to 50 seaward.

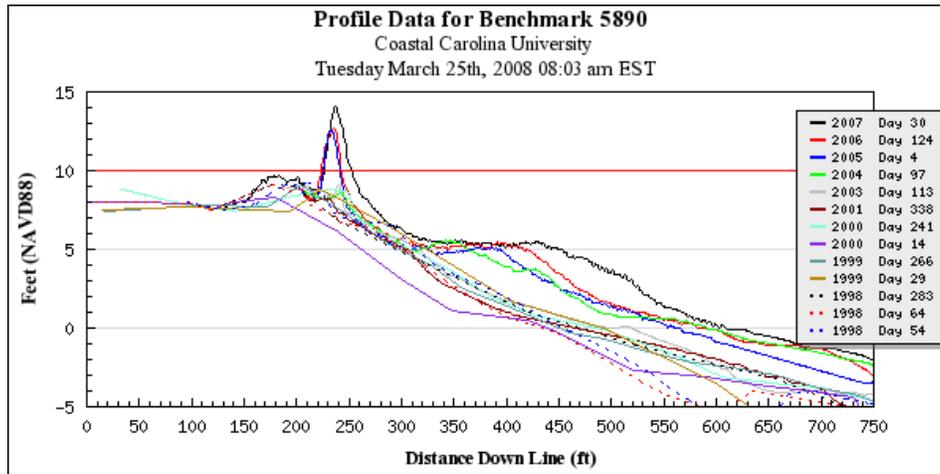


Figure 40. Beach profile data for Station 5890 in North Myrtle Beach.



Figure 41. The north end of Cherry Grove, where inlet processes make this region very dynamic. A new sand bar welds on to the shoreface here.

Waties Island

Waties Island (listed here with a spelling change from the previously used “Waites” for historical and geographical name accuracy) is an undeveloped three-mile long barrier island located between Hog Inlet to the southwest and Little River Inlet to the northeast. Little River Inlet was stabilized by the construction of a jetty system between 1981 and 1983. The southwest end of Waties Island is an unstabilized inlet zone, the central portion is a standard zone, and the northeastern section is a stabilized inlet zone. Most of the island has a long-term erosion rate ranging from -4 to -10 ft per year, although jetty construction has helped to stabilize the shoreline and lessen the erosion. During most of the 1990’s the Hog Inlet shoreline was extremely erosional, losing several hundred ft, but has changed to an accretional mode in recent years. There are 6 monitoring stations on Waites Island, which were most recently surveyed in May 2004, January 2005, December 2005, and May 2007.



Figure 42. Benchmark locations for Waties Island.

Table 20. Data for benchmarks on Waites Island.

| Benchmark | Profiles collected in 2007 | Profiles collected in 2006 | First Survey Year | Total Profiles |
|------------------|---------------------------------------|---------------------------------------|--------------------------|-----------------------|
| 5995 | 05/11 | None | 1989 | 20 |
| 5975 | 05/11 | None | 1989 | 28 |
| 5960 | 05/11 | None | 1988 | 33 |
| 5945 | 05/11 | None | 1989 | 32 |
| 5930 | 05/11 | None | 1990 | 30 |
| 5915 | 05/11 | None | 1988 | 28 |
| 5905 | 05/11 | None | 1989 | 33 |

During the current survey periods almost all profiles at Waites Island were stable or showed signs of moderate accretion on the upper beach. Station 5905, closest to Hog Inlet at the south end of the island, had showed some signs of erosion and was slightly erosional between 2002 and 2003, but has been accretional since then. During the previous survey period the primary dune here with a crest elevation of +14 ft was stable, while an emerging dune seaward of the primary dune continued to develop. Station 5915 showed the same characteristics—a stable primary dune at +15 ft and a smaller dune developing on the seaward side of it.

The remaining stations on Waites Island, 5930, 5945, 5960 and 5975, were all quite stable through the current survey period, with a gain of sand on the seaward side of the primary dune. The primary dune at Station 5930 grew approximately four ft from 2005 to 2007, with prominent accretion in the upper beach. In general, it appears the accretional phase that began on much of the island several years ago is continuing. This may be due to the long-term stabilizing influence of the Little River jetties, which may eventually decrease the officially adopted long-term erosion rates on Waites Island.

State-Wide Summary

The survey year 2007 had a few storms that influenced the coast. In May, before the tropical season began, subtropical storm Andrea brought heavy rain to the Pee Dee region (data on this storm event is available at the South Carolina State Climatology Office at http://www.dnr.sc.gov/climate/sco/ClimateData/yearly/cli_sc2007review.php) and some shoreline erosion from wind-driven waves. In early June, Tropical Storm Barry followed up the coast with wind gusts of approximately 60 mph near Charleston on June 2. A cold front moving across the state during the first few days in October also caused strong winds, high tides and beach erosion. Two cabins at Hunting Island State Park were threatened during this storm event and subsequently dismantled by the SC Dept. of Parks, Recreation and Tourism.

Several beach renourishment projects have been conducted in South Carolina in recent years. In response to the extensive erosion of the 2004 hurricane season a major beach renourishment project was sponsored by the Army Corps of Engineers at Folly Beach during the summer and fall of 2005, using a combination of federal and municipal funding. In addition, \$4.75 million dollars in state renourishment funding was allocated to Edisto Beach State Park and the Town of Edisto Beach for a beach renourishment project in 2006. Other renourishment projects during 2006 include a privately funded project at DeBordieu Beach, a state-funded renourishment project at Hunting Island State Park, and a locally funded project at the Town of Hilton Head Island that started in September 2006 and ended in March 2007. Finally, a smaller renourishment project designed to replace sand lost during the 2005 hurricane season was constructed at portions of Folly Beach during 2007.

In general the inlet zones, those beaches closest to unstabilized tidal inlets, are the most dynamic beaches and may experience the greatest shoreline erosion or accretion. Other sections of beach away from tidal inlets can still experience chronic beach erosion. Regardless of its designation as an inlet zone or standard zone, any section of beach with a sand deficit and a minimal beach width should be considered vulnerable to storm

damage, since the dunes and dry-sand beach provide a buffer between the ocean and high-ground development. At present, the most erosional beaches throughout the state, with sand deficits and a minimal dry-sand beach width at high tide, are listed from south to north as follows:

- **Hunting Island** – the southwestern end of the island. Several cabins in this area were threatened and subsequently dismantled during storm conditions in the fall of 2007, and others cabins remain threatened.
- **Harbor Island** – the northeastern end of the island. Chronic erosion in portions of this gated community has resulted in ocean water coming up under several houses at high tide.
- **Sullivans Island** – the northeastern end of the island, near Breach Inlet. Similar to Harbor Island, chronic erosion here has also resulted in ocean water coming up under several houses at high tide.
- **Isle of Palms** – the northeastern end of the island near Dewees Inlet, in the gated community of Wild Dunes. As a result of a shoal-attachment episode in this dynamic area, this beach is highly erosional and many structures are threatened.
- **Pawleys Island** – the southern end of the island, near Pawleys Inlet. Many houses here have minimal protection, and the parking area which provides most of the public beach access in Georgetown County is in jeopardy.

DHEC-OCRM

1362 McMillan Ave., Suite 400

Charleston, SC 29405

(843) 953-0200

This report was prepared by Dr. Scott Harris, Department of Geology and Environmental Geosciences, College of Charleston, and Bill Eiser, staff oceanographer for the South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resource Management. This report is available on the internet at www.scdhec.net/environment/ocrm. Beach profile data are available on the internet at <http://gis.coastal.edu/pmas>.